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TAYLOR'S PRINCIPLES AND PRACTICE
OF MEDICAL JURISPRUDENCE

FRED. J. SMITH

BY THE SAME AUTHOR

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THE

PRINCIPLES AND PRACTICE

OF

MEDICAL JURISPRUDENCE

BY THE LATE

ALFRED SWAINE TAYLOR, M.D., F.R.S.

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON

FIFTH EDITION

EDITED, REVISED, AND BROUGHT UP TO DATE BY

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FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON, FELLOW OF THE ROYAL COLLEGE OF SURGEONS, ENG., LECTURER ON MEDICAL JURISPRUDENCE AT THE LONDON HOSPITAL MEDICAL REFEREE TO THE HOME OFFICE

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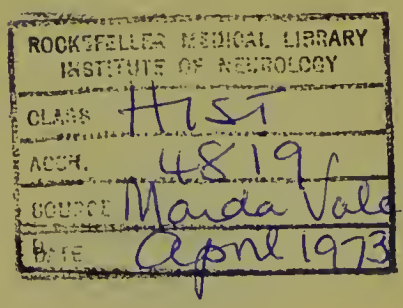
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EDITOR'S PREFACE.

In his time, the late Dr. Alfred Swaine Taylor was undoubtedly the leading English medical jurist and toxicologist.

Contrary to the usual rule in authorship, the "Principles and Practice" was developed out of his "Manual" instead of the larger work being "boiled down" for the "use of students." It was in November, 1843, that the first edition of Taylor's "Manual" was published. Between 1843 and 1861 it ran through no less than seven editions, and we may say went on eventually to twelve editions, the eleventh and twelfth of which appeared in 1886 and 1891 respectively, edited by Sir (then Dr.) Thos. Stevenson. Of late the place of the "Manual" would appear to have been largely taken by more recent works, for no subsequent edition has been called for.

In the meantime, the first edition of the "Principles and Practice" appeared in October, 1865. Its publication was due to the author's belief that a comprehensive treatise would be welcomed by members of the legal profession and others specially interested in the subject. That this belief was justified was proved by the steady exhaustion of an edition about every ten years (second, published September, 1873; third, edited by Dr. Stevenson, April, 1883; fourth, ditto, in February, 1894), a fair rate of sale considering the expense of the work and the limited public to which it appealed, considering also the character of the work as a book of reference rather than one for teaching purposes or to be generally read.

When in the autumn (to be exact, in the last week in October) of 1903 Messrs. Churchill approached the editor with a view to bringing out a fifth edition, his first impulse was to decline an attempt to bring up to date the standard work in the English language on such a many-sided subject as medical jurisprudence. On receiving, however, many kind offers of assistance from colleagues and friends, he determined to undertake the task with what success he might. He had one comfort in undertaking it, which was that such a work, dealing as it must with

extremes of possibilities, could not be expected to represent the views or experience of one man or many men; it must remain to a large extent a collection of cases gathered from all sources, and that, therefore, he might act very largely as a simple collector of other people's experience. In this respect he has availed himself freely of the *Lancet*, the *British Medical Journal*, Dixon Mann's "Forensic Medicine," also Luff's work on the same subject, *The Times*, and other newspapers, the "Records of the Old Bailey," etc., etc., and returns here thanks for the assistance he has derived from these publications. It is only in a few places that he has ventured on offering any personal views on the subjects and cases in the work.

The last ten or twenty years have witnessed such unparalleled activity in all branches of the sciences ancillary to medicine in general, and medical jurisprudence in particular, that the editor has found it necessary to rewrite almost entirely some articles and to recast the whole plan of the work in order to bring it into line with the results of this activity. He fears, therefore, that many to whom the old "Taylor" was familiar may feel themselves somewhat astray in finding their way through the new edition. To such the editor can only apologise and plead compulsion, for he found it impossible to maintain the old order. He trusts, however, that in thus altering the work he has omitted nothing that might now be of value, and has added something that may stand the test of time as well as that which Dr. Taylor wrote has done. He has spared no pains in making the index to each volume as complete as possible to facilitate the finding of any case or reference.

With this activity in scientific investigation legislation has not been idle, and many new Acts have been placed on the Statute Book, even since the fourth edition appeared. The Infectious Diseases Notification Act, the Workmen's Compensation Act, 1897, the Criminal Evidence Act, 1898, are totally new, while numerous amending Bills to many Acts have been passed. All this legislative activity has resulted in multiplying many times over the occasions for the appearance of medical men in the witness-box to give evidence of a more or less technical character.

The Registration of Births and Deaths Act and the Medical Acts have not yet received the attention they deserve at the hands of Parliament. They sadly need revision in the interests of the public as well as of the medical profession.

The great difficulty the editor has met with has been the determination of what to omit from the original, so that the necessary

new material might not make the work too bulky. Dr. Taylor's cases were chosen with such skill for their illustrative qualities, and his remarks on them were so judicious (judicial one might almost say), that in many instances the editor felt cómpelled to leave them intact, for it was impossible to improve on them. All the same, it has been found necessary to increase the bulk of the work by some pages.

The excision of nearly all the woodcuts demands some explanation. Several considerations influenced the editor in omitting them. Firstly, their omission left room for a good deal of letterpress without increase of bulk; secondly, the editor felt that if the work was to be illustrated at all it must be illustrated thoroughly, and this would have raised the cost of the work to an almost prohibitive figure. Moreover, the idea of illustration has been already carried out on an almost perfect scale ("Atlas of Legal Medicine," by Dr. E. Von Hofmann, translated and edited by Peterson and Kelly, Rebman Publishing Company, 1898). This work consists entirely of beautiful coloured plates, with merely sufficient letterpress to explain their meaning. Lastly, illustrations of all kinds are now copiously distributed through every work of anatomy, physiology, chemistry, medicine, teratology, bacteriology, botany, etc., etc., and it is, therefore, unnecessary, if not impossible, to reproduce them in a work which needs the assistance of all these subjects collectively.

Throughout the work there will be noted the introduction of paragraphs of a smaller type. This was originally for the purpose of printing the cases only, but the work was so profusely illustrated by cases that many have escaped the editor's eye in reprinting until it was too late, and will be found in ordinary type. The editor has found the same type of great use also for quotations, the difference in type marking a quotation much better than the easily-overlooked inverted commas; but for this purpose, too, he has been unable to be strictly consistent, though he trusts that his inconsistencies will not lead to confusion. The exigencies of time and the difficulties of seeing a large work through the press are his only excuses.

For the short section on "Indian Medical Jurisprudence" the editor has no responsibility beyond that of seeing it through the press. He was obliged to leave it in the hands of its author, who has had a very large experience.

Many old references to foreign journals previous to the year 1850 have been omitted, in fact, all which referred only to principles which are now better understood; but the editor trusts that nothing of

importance has been omitted, while many new references will be found. In this connection the most valuable contribution has been made by Mr. S. B. Atkinson, whose alone is the credit of the Bibliographical appendix.

It is, lastly, the very pleasant duty of the editor to return his heartiest thanks to those who have helped him in his task. Sir Thos. Stevenson himself stands at the head of the list, who with rare generosity placed at the editor's disposal without reserve all the material he had collected since the fourth edition was published under his care. Mr. Lowndes, of Liverpool, Mr. Stanley B. Atkinson, and Dr. Bulloch, have been more than generous in assistance. Indeed, the compilation of the appendices is entirely the work of Mr. Atkinson, who has also revised many sheets of proofs, with the addition of a large number of valuable references.

F. J. S.

138, Harley Street,
London, W.
Feb., 1905.

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THE

PRINCIPLES AND PRACTICE

OF

MEDICAL JURISPRUDENCE.

SECTION I.

INTRODUCTION.

BOUNDARIES AND DEFINITION OF MEDICAL JURISPRUDENCE.
MEDICAL JURIST DIFFERENT FROM A MEDICAL MAN.
MEDICAL MEN AS WITNESSES.
NOTES AND REPORTS ON CASES.
PASSAGE OF A REPORT FROM COURT TO COURT; DEPOSITIONS.
CORONERS' INQUESTS; NEED FOR SPECIAL PATHOLOGISTS.
SUBPŒNA; ITS AUTHORITY.
TAKING THE OATH.
EVIDENCE: ORAL AND DOCUMENTARY; EXAMINATION-IN-CHIEF.
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QUOTATIONS FROM BOOKS.
MEDICAL PRIVILEGE; PROFESSIONAL SECRECY.
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EXPERT EVIDENCE: DEFECTS IN THE SYSTEM; REMEDIES FOR THESE DEFECTS.
DOCUMENTARY EVIDENCE: AFFIDAVITS, ETC.; NOTES AND DEPOSITIONS; DYING DECLARATIONS.
PRESENCE IN COURT.
FEES.

Medical Jurisprudence—or, as it is more commonly called, Forensic or Legal Medicine—is a branch of Medicine, and may be defined to be that science which teaches the application of every branch of medical knowledge to the purposes of the law; hence its limits are, on the one hand, the requirements of the law, and on the other, the whole range of medicine. Anatomy, physiology, medicine, surgery, midwifery, gynæcology, and the sciences ancillary to these, viz., bacteriology, chemistry, physics, and botany, etc., all lend their aid as necessity arises; and in some cases all these branches of science are required in the same case to enable a court of law to arrive at a proper conclusion on a contested question affecting life or property. In St. Bart.'s Hosp. Reports, vol. 39, will be found an interesting article on "Forensic Physiology," by S. B. Atkinson, which discusses the limits of Medical Jurisprudence.

Medical jurists are by no means agreed upon the exact boundaries of their science. Some authorities have included forgery and coining, and all offences requiring purely chemical evidence; others include nuisances, and subjects connected with public health or sanitary legislation. Public health is now, however, generally excluded from treatises on Forensic Medicine. Feigned disease must obviously be included, now that compensation is by law demanded of employers for accidents to their workpeople, not to mention the large subject of feigned insanity when criminals try to escape from punishment by feigning disease of the mind. One German writer introduced the government and regulation of Temperance Societies. Those who thus propose to enlarge the science forget the maxim, *Ars longa, vita brevis;* and they also forget that, by demanding too much of a medical practitioner, they may deter him from undertaking the study of that portion which may really prove serviceable to him in the practice of his profession. STATE MEDICINE properly includes both Medical Jurisprudence and Hygiene, though the term State Medicine is becoming restricted to Public Health alone.

The purpose of this work is to bring as far as possible within a reasonable compass those subjects which especially demand inquiry from, and which more particularly concern the duties of, the educated physician and surgeon in his relation to the law. The definition above given necessarily implies that a medical jurist should have a theoretical and practical knowledge of all branches of the profession, a large range of experience, and the rare power of adapting his knowledge and experience to emergencies. He should be able to elucidate any difficult medico-legal question which may arise, and be prepared at all times to make a cautious selection of such medical facts, and a proper application of such medical principles, as may be necessary to enable a judge to place the subject in an intelligible light before the jury, and to enable a jury to arrive at a just conclusion.

Medico-legal knowledge does not consist so much in the acquisition of facts as in the power of arranging them, and in applying the conclusions to which they lead to the purposes of the law. A man may be a most skilful surgeon, or a most experienced physician; his mind may be well stored with professional information; yet if he is unable by the use of simple language to make his ideas known to others, his knowledge will be of no avail. One far below him in professional standing and experience may make a better medical witness. There was no doubt that John Hunter stood in his time at the very head of his profession, and that none could have profited more by industry and experience. If sound professional knowledge could have qualified any man to act as a medical witness, we should assuredly be justified in pointing to him as an example; and yet this great man, when summoned to give evidence in 1781 on a memorable trial for poisoning, was obliged to confess that he was unable to give a definite answer to the important question put to him. Hunter was the only professional witness called on the part of the prisoner to rebut the charge of poisoning the deceased by laurel-water. His cross-examination, however, rather strengthened the case for the prosecution; and the final question put by the court was: "Give your opinion, in the best manner you can, one way or the other, whether, upon the whole of

the symptoms described, the death proceeded from the medicine (laurel-water), or any other cause?" *A.* "I do not mean to equivocate; but when I tell the sentiments of my own mind, what I feel at the time, I can give nothing decisive." With that candour which exists in all great minds, Hunter admitted his deficiencies; and he regretted to the latest period of his life that he had not directed more attention to subjects of this nature. It might be thought from his answer that he should not have appeared in the case at all, but it must be remembered that in Hunter's time the science of medical jurisprudence was unknown in this country, but the want of it was clearly perceived.

The case excited so much public interest, it has been so constantly commented on since, and illustrates so well the principles we are now discussing that a brief outline of its principal features is not out of place (*Rex* v. *Donellan*, Warwick Lent Assizes, 1781, and Palmer's Life of Hunter, vol. i, p. 81). The facts ascertained were that Sir T. Boughton, a young man, previously in good health, expired in convulsions about half an hour after taking a draught of rhubarb and jalap sent by his medical man with which it was alleged that Captain Donellan had mixed laurel water, as the victim's mother observed that it smelt of bitter almonds when administered. It was not till ten days after death that the body was exhumed and examined by several medical men. This exhumation was ordered because suspicions of poison had been excited. The examiners did not open the brain, nor did they investigate the condition of the intestines. No analysis either of the contents of the stomach or of the remainder—if any—of the draught was made. Hunter deposed that the appearances found in the stomach were ordinary post-mortem changes with which he was quite familiar, probably more so than any man of his time; that the symptoms with which the victim died were quite compatible with apoplexy or epilepsy, a point which might have been cleared up by proper examination of the brain. He allowed in his cross-examination that the occurrence of the symptoms immediately after taking the draught was a circumstance in favour of its having caused them, and "if," said he, "I *knew* that the draught had contained poison, I should say that most probably the symptoms arose from that." He was, however, directed by the judge (Buller) to separate the medical *facts* he had observed from the suggestions that poison had been administered, and on this direction he declared that there was no direct medical evidence to show how death had been caused. The prisoner was convicted and hanged.

Analysing this case in the light of our present-day knowledge, so far at least as the medical evidence is concerned, the conviction seems to have rested almost entirely on circumstantial evidence. There can be no doubt that if death was due to poisoning at all it was due to poisoning by a dilute solution of hydrocyanic acid; and, as may be seen by reference to Sections on "Poisons," the post-mortem evidence of this is, apart from smell and analysis, very vague, not to say absolutely indecisive. Hence one can have no hesitation in saying that Hunter's evidence was as straightforward as his knowledge would permit, for the smell would probably have passed off in ten days, and there was then no means available for exact analysis of the contents of a stomach; and instead of blaming him one should rather take his evidence as the type of what medical evidence ought to be. The real flaws in the evidence arose from (1) the incompleteness of the post-mortem examination, which was no fault of Hunter's, but does point a warning to all medical men under similar circumstances, and (2) the difficulties of analysis insuperable in those days, but which are now easily overcome if the medical man will only take those precautions which will be found in Sections on "Poisons."

The variety of subjects in which a medical jurist is required to have

knowledge and experience may alarm a student of medicine, and lead him to suppose that, as he cannot make himself perfectly acquainted with all, he may well forego the labour of preparing himself in any. But this would be taking an erroneous view of his position. The above description of the qualifications necessary to constitute a good witness in a court of law must not deter him from entering on the study. It is assuredly beyond the mental power of any individual that he should be at the same time profoundly versed in all the principles of medicine and jurisprudence, and that he should be able to answer all possible questions, and encounter and remove all medical difficulties that may occur during the trial of a civil or criminal case. All that the law expects from a medical man is a fair average knowledge, not merely of his profession, but of those data which come more peculiarly within the province of a medical witness. There can be no doubt that the more perfectly a man has made himself master of his profession, the better will he be fitted to follow the principles and apply himself to the practice of medical jurisprudence; but he must divest himself of the notion that these principles can be spontaneously acquired, or that they are necessarily derived from the study of those isolated branches of medicine upon which medical jurisprudence is based. The materials for the medical jurist undoubtedly exist in these collateral sciences; but they require to be assorted, selected, and moulded into shape, before they can be applied to any useful purpose.

The duties of a medical jurist are distinct from those of a practising physician or surgeon: the latter looks to the treatment of disease or accident, and the saving of life; but the object of the former, in a large proportion of cases, is, whether in reference to the living or the dead, to aid the law in fixing on the perpetrator of a crime, or to rescue an innocent person from a falsely imputed crime. Thus he may be required to determine whether, in a particular case, the cause of death was natural or violent; and for this purpose it will be necessary for him to make an entirely new application of his professional knowledge. He has now the difficult task of making a selection from those parts of the medical sciences which bear upon the legal proof and development of crime.

Some members of the medical profession have been inclined to look upon medico-legal practice as an unnecessary addition to their ordinary duties, but there are few who have been long engaged in the practice of the profession who have not found themselves occasionally placed in situations of difficulty from the accidental occurrence of cases demanding medico-legal investigation. A medical man is summoned to attend a person labouring under the effects of poison criminally administered, but at the time he may have no knowledge or even suspicion that poison is the cause of the symptoms. In spite of the best treatment, death ensues. Here the functions of the medical man end, and those of the medical witness begin. It is impossible that he can now avoid giving evidence, or shift the responsibility to another—the law will insist upon his appearance, first in the court of the coroner, and afterwards at the assizes. It will be assumed that, as a registered member of the profession, he is fully competent to answer every question put to him by judge and counsel relative to the general effects of poison, the quantity of each required to destroy life, and the time within which a poison

may prove fatal. It may be objected to his evidence that the deceased had died from the effects of disease, and not from poison, in which case the examination will lead to a searching inquiry into all those diseases which resemble poisoning in their symptoms and post-mortem appearances, as well as the means of making a certain distinction between them, and the fallacies to which the chemical processes for the detection of poison are liable. He will inevitably be asked if any traces of disease were present in any organ, and hence, as above illustrated, the importance of making an examination complete in all details. On another occasion a medical man may be called to render assistance to one who has been stabbed in a quarrel, and who speedily dies from the wound. The office of the surgeon here ceases, while that of the medical jurist commences. He must now be prepared to answer numerous questions, all bearing upon the legal proof of crime, all necessary in law, although apparently superfluous in surgery. Thus he may be asked to state the precise characters of a wound inflicted upon the body of a man soon after death, and by what means a particular wound was inflicted. Was it homicidal or accidental? The amount of blood lost? Whether the person could have moved or performed any act after receiving it? Are certain stains found upon his clothes, or upon a knife belonging to him, owing to effused blood or other causes? Whether any, and what, statements were made by the dying man, and what were the precise circumstances under which they were made? It need hardly be observed that questions of this nature are rarely noticed, except in a cursory manner, by professors of chemistry and surgery, and a medical man is not likely to acquire the means of answering them by intuition. On the other hand, regarding ourselves as living in a civilised state, in which the detection and punishment of crimes against life and property are indispensable to the security of all, it is impossible to overrate their importance. Unless a witness is able to return answers to these questions when a public necessity occurs, a guilty man may escape punishment, or an innocent man may be condemned. He may thus most seriously injure his own reputation; for it is certain that his qualifications as a physician, surgeon, or general practitioner, however great, will not shield him from the reproach of having caused a failure of justice. Again, the dead body of an infant is, to a healer of the sick, a corpse, and nothing more; he is too late to be of use; but to the medical jurist it is a human sphinx from which he is expected to extract answers to many questions: Was it mature or immature? Could it have been, and was it, born alive? If so, how long did it live? Was it killed, and if so, how? Or did it die a natural death? if so, why? On the answers to these questions may hang the life of a fellow-creature, and at least the honour of a sister.

Thus, then, it is obvious that the duties of a medical jurist are of a highly responsible nature and of great importance to society, while the cases which call them into exercise are of purely accidental occurrence. A medical practitioner who thinks himself secure in the most retired corner of the kingdom is liable to find himself suddenly summoned as a witness on a trial, to answer questions which perhaps during a long period of practice he had been led to regard as trifling and unimportant. Under the circumstances it is scarcely possible that he can

avoid exposing his deficiencies, and the final question will be, "*Have you ever attended to or thought of these subjects before?*" A negative answer to this question, while it commonly brings with it public censure, will in most instances lead to the acquittal of the accused in spite of strong presumptions of guilt.

The truth of this picture will be felt and acknowledged by those who have been a few years engaged in practice. The records of our law-courts contain many unfortunate exposures which might have been easily avoided had the witnesses only availed themselves of the opportunities afforded to them of acquiring a knowledge of the subject; but they had unreflectingly acted on the principle that medical jurisprudence was a dry, dull, and useless study, and that the practice of it was remote and speculative. For a few further remarks on this aspect of the subject, *vide* under Coroners' Inquests.

MEDICAL MEN AS WITNESSES.

Some medical men who have treated legal medicine with indifference have occasionally ventured to act as witnesses, thinking that the subjects on which they were likely to be examined were so little known to judge and counsel that even hazardous or rash statements would escape observation. Such witnesses, however, have often found, to their cost, that they were labouring under a great delusion. Various circumstances have led, in recent times, to the acquisition of much medico-legal knowledge by lawyers, especially in relation to questions connected with wounds, child-murder, and poisoning; and they are not slow in detecting and exposing a mere pretender who attempts to shelter himself by vague or evasive statements and technical language. There are few counsel engaged in any civil or criminal case of importance who do not take care to fortify themselves, under medical advice, with a full knowledge of the views of standard medical writers on the subject in dispute; and with these works before them, and with their proverbial acuteness, he must indeed be a clever witness who can succeed in passing off an erroneous or evasive answer to a medico-legal question.

It is a frequent charge against members of the medical profession that in a court of law they are the worst witnesses on matters of fact and opinion. This is an unmerited censure. Those who are ready to make this charge overlook the complexity and difficulty of the questions which are put to medical men compared with those put to other witnesses.

The following paragraph from the *Brit. Med. Jour.*, 2, 1903, p. 1545, is interesting as showing that even now judges do not appreciate the position of medical witnesses:—

"Mr. Justice Gibson had before him last week a motion in the matter of *McNally* v. *Great Northern Railway*, in which it was sought to have the case remitted to the county Down for trial. It appeared that one medical man said that the plaintiff had inflammation of the knee-joint; the other believed the stiffness would disappear with gentle exercise. The judge said this was not a matter of opinion, but of certainty, and he should like to send down an expert to make a disinterested report. This could not be done, as the plaintiff's counsel had no instructions

on the point, and the case was remitted, Judge Gibson remarking 'that the medical gentlemen in the case had differed on an elementary matter of surgery, as to which neither of them ought to have been mistaken. A difference of speculative opinion was pardonable, but this was a difference on a matter of surgical fact.' The suggestion that an experienced surgeon should examine the case and report was quite admirable. It is the recognition of the principle of assessors in the hearing of cases where medical or surgical problems arise, which problems a few lawyers and a dozen poor laymen set about settling with amusing confidence. But to suggest that there ought to be no difference on a question of surgical fact in connection with a knee-joint only shows where the legal mind, entirely uninformed in these matters, fails to apprehend the position. There is plenty of room for difference about 'surgical facts' in a knee-joint and the interpretation of them."

Critics also forget that medical men are much more frequently summoned as witnesses than the members of the two other learned professions. Their evidence obtains greater publicity, and is necessarily exposed to greater criticism. The author was, on one occasion, present at a trial before Lord Truro, in which the action was between two members of the legal profession, and the witnesses on both sides were chiefly barristers, solicitors, and solicitors' clerks. The questions put to the witnesses were so cleverly met and so technically evaded, that it was scarcely possible to obtain a plain statement or a consistent history of the most simple facts of the case. A direct answer could not be procured on any question, and the mode in which the witnesses gave their testimony elicited on several occasions rebukes from the judge. The fact is, that good and bad witnesses are to be met with in every profession; and under equal conditions there is no reason to suppose that one would furnish a greater number of incompetent witnesses than another. It is certainly the fault of medical men that they are not generally prepared for the questions which are likely to arise in a case on which they know they will be required to give evidence. This want of preparation frequently applies to facts as well as to opinions. Thus, in reference to a case on which a charge of murder or manslaughter may be ultimately founded, a medical man who is called in frequently omits to observe many circumstances because they appear to him to be irrelevant or to have little importance, although at the subsequent trial he may find, to his dismay, that they actually become the turning-points of innocence or guilt. Medical observation as a result of professional habits is, on these occasions, in general confined to only one set of circumstances: the recognition and treatment of disease or personal injury; but medico-legal observation should take a much wider range than this, and should be directed to all the surrounding facts and incidents of a case. The essential difference in the two kinds of practice is, that circumstances which are of no interest in a medical or surgical point of view are often of the greatest value and importance in legal medicine. It is obvious that if they are not observed by a medical witness when he is first summoned to the injured person, whether dying or dead, it will be out of his power to meet many of the questions which must arise in the progress of the case. The non-observance of these facts is a

serious evil, and often carries with it, although unjustly, an imputation of professional ignorance.

The first duty, therefore, of a medical jurist is to cultivate a faculty of minute observation of medical and moral circumstances. This, when combined with a general knowledge of what the law requires as evidence, will enable him to meet in a satisfactory manner all the scientific questions that may be necessary for the elucidation of a case. The exercise of this faculty is by no means inconsistent with the performance of his duties as a physician or surgeon. Some eminent professional men have been known to possess this power as a natural gift.

Sir Astley Cooper was called to see a man who, while sitting in his chair in a private room, had been mortally wounded by a pistol-shot from the hands of an unseen person. Sir Astley having done what was necessary respecting the wound, compared closely the direction from which the pistol was fired with the position of the wounded man, and he came to the conclusion that the pistol must have been fired by a left-handed man. The only left-handed man known to be on the premises at the time was an intimate friend of the deceased, against whom there was no suspicion; but this acute observation led to his arrest and trial, and he was subsequently convicted of this act of murder.

The condition and position of the body of a person dead from wounds, the position of a weapon, and the state of the dress and weapon, as well as the form and direction of the wound itself, are not always noticed with sufficient accuracy. It is, however, only right to say that many medical men in the present day show great acumen in their examination of these cases.

The author was present at a trial for murder in which the evidence showed that a man had been stabbed in the chest, and he died almost instantly from a wound in the heart. The act had been perpetrated by some one in a crowd in the dusk of the evening, but no one was seen to strike the blow, and no weapon was found near the spot. The surgeon observed that the wound in the chest was sharp at one angle and rounded at the other, and he gave his opinion that the wound had been inflicted with a knife having one sharp edge, and not with a dagger or double-edged knife. Within a few hours after the occurrence a man was arrested on suspicion, and a knife which he attempted to conceal was taken from him. It was in a sheath, and had at this time *wet* blood upon it, showing a recent use of the weapon. It was a pointed knife, with a broad blade, and one sharp edge only—such a weapon as, in the opinion of the surgeon, would have produced the stab in the chest. The man was tried and convicted, the observation of the surgeon respecting the state of the wound and the weapon furnishing important evidence of his guilt. On the other hand, want of observation may lead to the discharge of guilty persons. A woman was found dead in her bed with some lacerated wounds of the scalp. There was strong reason to believe that these had been produced by criminal violence, but it was suggested for the defence that, as there were projecting nails at the head of the bed, these lacerations might have arisen from accident—a suggestion supported to some extent by the medical evidence. An experienced witness, however, stated that from his examination he did not believe that the nails, even if they were in the bedstead at the time of the occurrence, could have produced the wounds. He also said that as blood had issued from the wounds, and there was no blood about the nails or the part of the bed around them, he did not believe that the head had at any time come in contact with the nails. Those who were first called to the dead body had omitted to notice whether there was anything on or near to the bed to account for the wounds on the scalp, and they were quite unable to say whether there were or were not any projecting nails at the head of the bed when they first examined the body. The prisoner was discharged on the Scotch verdict of "Not proven"; and there was some reason to believe that he escaped through manufactured evidence, *i.e.* that the nails had been driven into the head of the bed subsequently to the death of the woman.

At any rate, it seems perfectly clear from a general view of the medical evidence that the wounds could not have been produced by the nails in the manner suggested, and that the wounded portion of the scalp had not at any time been in contact with them. As they were lacerated wounds, and so might have been produced by nails, the accused had the benefit of the doubt which was thus raised in the minds of the jury.

The judge who tried this case remarked that "*a medical man, when he sees a dead body, should notice everything.*" Undoubtedly he should observe everything which could throw a light upon the production of wounds or other injuries found upon it. It should not be left to policemen to say whether there were any marks of blood on the dress, or on the hands of the deceased, or on the furniture in the room. The dress of the deceased as well as the body should be always closely examined at once on the spot by a medical man. The importance of this precaution is well illustrated by a case related in another page, in which a man just escaped committal on what would have proved a false charge of murder by reason of the examination of an article of dress accidentally produced at the adjourned inquest.

There is another point which is frequently omitted on these occasions, and the omission may give rise to great inconvenience, if not to a failure of justice. Thus, in reference to a dead body, no observation is made at the time of the visit whether it or any part of it is cold or warm, whether the limbs are cold and rigid or cold and pliant. In a medical and surgical view these conditions of the body are of no importance, but medico-legally, if the facts are observed, they may enable a witness to speak with greater or less probability as to the time of death ; this may make all the difference between the acquittal and conviction of a person charged with murder. The case of Gardner, elsewhere related, will show the importance of observations of this kind. The circumstances which chiefly require notice on these occasions have been fully described in the section on Wounds. In reference to supposed death from poison, other matters will also require special attention. These will be found in detail in the Sections on Poisoning.

It may stimulate the attention of a medical practitioner in reference to these inquiries if he is informed that it is a great art of counsel defending persons charged with murder or manslaughter to endeavour to discover what he omitted to do. Although sometimes the omission may be really of no medical importance whatever, yet it may be placed before the jury in such a strong light that the accused obtains the benefit of a doubt. The omission may be attributed to professional ignorance, or, what is worse, to professional bias—a determination to find proofs of guilt against the "unhappy prisoner at the bar"—when the facts might be innocently explained by a want of experience on the part of the witness in dealing with cases of this nature.

NOTES AND REPORTS ON CASES.

In the ordinary course of practice there can be no doubt that the fuller and more complete the notes that are kept of every case of sickness the better it is for the patients and for the medical man should any

question arise which might necessitate the production of such notes, whether kept in a day-book or not, and such notes may be of immense service in refreshing the mind of a medical man when he is called upon to answer some question bearing upon an antecedent illness; hence it is very good advice to all medical men to keep notes of all their cases. Such a complete scheme is, however, in a large practice hardly practicable. Nevertheless it is of the most extreme importance to urge all medical men to make as copious notes as possible at the very first moment that the slightest degree of suspicion arises that any case may ultimately prove to become the subject of a medico-legal inquiry.

When suspicion that a case may become the subject of inquiry has come to be a certainty, it is then not simply advisable, but it is the absolute bounden duty of the medical man, to commit to writing at the very earliest possible moment all he has hitherto observed of the case, all he can now observe, and, if the case does not terminate at once or has not already terminated, all he may observe in its further course. In various parts of this work—"Rape," "Wounds," etc., etc.—special reference will continually be made to the notes that ought to be taken. His own observations must be kept distinct from information given by others; he may draw conclusions of value from the former, but the latter has to be proved before any conclusions can be drawn from it.

Owing to the ordinary procedure of law in this country, a person charged with the crime of poisoning may remain imprisoned for weeks before he is brought to trial. It is obvious, however clear the circumstances may at the time appear to a practitioner, that it will require more than ordinary powers of memory to retain for so long a period a distinct recollection of all the facts of a case. If he is unprovided with notes, and his memory is defective, then the case will turn in favour of the prisoner, who will be the person to benefit by the neglect of the witness. In adopting the plan here recommended, such a result may be easily prevented. It may be remarked that the law relative to the admissibility of notes or memoranda in evidence is very strict, and, in trials for murder, is rigorously enforced by the judges. In order to render such notes or memoranda admissible, it is indispensably necessary that they should be taken by the witness at the time the observations are made, or as soon afterwards as practicable; and further, it must be remembered that a witness can refer to them only for the purpose of refreshing his memory. He cannot read them out loud in the witness-box, giving them as his evidence; but he may, and most commonly does, read them there to himself. If he is known to have such notes, he may be required to produce them. He need not be afraid nor ashamed to produce dirty or bloodstained notes, for example, of an autopsy. Dirt does not destroy their value, and may so far be an evidence of their *bona fides*, and that they were made at the very earliest moment.

At a trial for murder, *Reg.* v. *Currell*, in 1887, Mr. Justice Grantham remarked on the medical evidence:—

> It was also unfortunate that the doctor first called in (Dr. Davis) had not made a proper examination and had taken it for granted that because she was dead she must have fallen against a chest of drawers. Dr. Burchell also was most inaccurate. He (his lordship) had always found that when a witness said he had such a good

memory that he took no notes, that witness was either very vain or very inaccurate. Dr. Burchell said he found two pieces of lead behind the tongue, while, in fact, he did not find them at all. His partner found the pieces. These points were not vital to the case, but they were, at any rate, important points.

Reports of Cases of a medico-legal nature are very frequently demanded from medical men, and such reports will obviously be based upon the notes which have just been commented on. Such a report should be a summary of the medical facts, and of the conclusions based upon them, expressed as much as possible in untechnical language.

It is obvious that such reports must materially vary in their contents according to the nature of the case dealt with. A history of a poisoning case will materially differ from that of a cut throat, for instance, but there are a few rules which are applicable to the proper drawing up of any such report, and they are worth careful consideration.

1. Dates.—These must in all cases be given very carefully, and in such a manner as to leave no room for doubt, nor to necessitate reference to almanacks. *E.g.* such a phrase as "Last Tuesday I saw Mr. Jones" must never occur; it must run, "At 11 a.m." (the hour accurately stated) "on Tuesday, the 19th September, 1897" (the day, month, and year being fully set forth), "I saw Mr. Jones." Careful distinction must be drawn between the date of the facts occurring and the date of the report itself.

2. Sex, age, and occupation of the person reported upon are also matters that should not be slurred over nor omitted.

3. In drawing up a report of symptoms and appearances after death, the facts should be in the first instance plainly and concisely stated *seriatim*, in language easily intelligible to non-professional persons. A reporter is not called upon to display his erudition, but to make himself understood. If technical terms are employed, their meaning should be stated in parentheses. When a subject is thoroughly understood, there can be no difficulty in rendering it in simple language; and when it is not well understood, the practitioner is not in a position to make any report. Magistrates, coroners, solicitors, and barristers, easily detect ignorance, even when it appears under the mask of erudition.

4. In recording facts, a reporter should not encumber his statements with opinions, inferences, or comments. The facts should be first stated, and the conclusions should be reserved until the end of the report. The language in which conclusions are expressed should be precise and clear. It must be remembered that these are intended to form a concise summary of the whole report, upon which the judgment of a magistrate, or the decision of a coroner's jury, will be ultimately based. They should be strictly confined to the matters which are the subject of inquiry, and which have actually fallen under the observation of the witness.

The reporter must remember that his conclusions are to be based only upon *medical* facts, not upon moral circumstances, unless he is specially required to express his opinion with regard to them when they are of a quasi-medical nature. Further, they must be founded only on what *he has himself seen or observed*. Any information derived from others should not be made the basis of an opinion in a medico-legal

report. It is scarcely necessary to remark that a conclusion based upon mere *probabilities* is of no value as evidence.

Notwithstanding the plainness, simplicity, and obviousness of these rules, they are all too frequently broken. The most frequent lapses it is desirable to draw further attention to. The statements are sometimes drawn up in exaggerated language; at others they are overloaded with technical and unintelligible terms, and the writer is often not sufficiently careful to keep his facts distinct from his comments. The former may be useful as evidence; the latter are inadmissible.

With respect to the first of these defects, it is very much the practice of medical men in drawing up reports of medical cases for professional purposes to use, unthinkingly, exaggerated language. Thus it may be observed in the drawing up of an ordinary post-mortem examination the lining-membrane of the stomach is described as being "intensely" inflamed, or some part is "considerably" injected, or a cavity is "enormously" distended. Expressions thus loosely employed convey to the legal mind a widely different meaning from that intended by the reporter. They create also great difficulty in evidence if withdrawn or modified, a change which other circumstances may show to be necessary, and at the same time they place the witness in an undesirable position before the court. On the other hand, if retained, they may render the facts unsusceptible of explanation upon any theory of natural disease. Such descriptions obviously imply a comparison with similar conditions in numerous other dead bodies; but what is the standard by which they are really measured, and what opportunity has the witness had of creating such a standard in his own mind? In general it will be found that such expressions have been used without proper consideration, from a habit acquired by the writer in reporting cases for the information of medical men only. Let him who is inclined to use them bear in mind that barristers look much more closely to the strict signification of words than medical men, and that they are always disposed to distrust the judgment of one who cannot speak or write without resorting to the use of the superlative degree.

The free use of *technical terms* in drawing up reports may be attributed to a similar practice in the profession. Putting aside those cases in which a medical man thinks he is displaying his erudition by the selection and use of such terms, there can be no doubt that great numbers of medical practitioners fall into this practice from mere habit. They think they are addressing the report to a medical society, instead of a coroner and jury who have never in their reading or experience met with such terms, and to whom therefore they are unintelligible. In a report on the appearances in the body of a man who had suffered from chronic insanity, the following passage occurred:—"The only morbid appearance in the brain was an atheromatous deposit in the Pons Varolii, near the situation of the locus niger." In another document, the reporter stated, for the information of a coroner's jury, that the "integuments of the cranium were reflected, and the calvarium was exposed." If a reporter will use such terms as these or others of a similar kind, such as "parietes of the abdomen," "epigastrium," "hypertrophy of the liver," when it would require no more trouble to put what he means in plain English, he

must be prepared to have his meaning perverted or wholly misunderstood. Setting aside the men who act as jurors, it may be observed that educated persons, such as coroners and magistrates, do not commonly include professional terms within the range of their studies. There are but few of them who understand the difference between perineum and peritoneum, or the meaning of the words hemispheres of the brain, pia mater, puncta cruenta, corpora quadrigemina, centrum ovale, &c. They are not likely to know the difference between the cardia and pylorus, nor the nature or situation of the duodenum, jejunum, ileum, or cæcum, and are as ready to consider them to be parts of the liver or urinary bladder as of the intestines. On one occasion a learned judge asked for an explanation of the meaning of the term "alimentary canal." A slight consideration will show to any medical practitioner that refined professional language is wholly misplaced in a report which is intended to inform and convince the minds of ordinary men upon plain matters of fact.

The last point which calls for comment in reference to medical reports is the loose manner in which facts and comments upon facts, as well as hearsay statements and arguments, are sometimes found blended. If a reporter takes care to eliminate facts from comment, his report is admissible, and may be read at the inquest or trial as evidence. The facts are for the jury; the comments upon the facts, introduced by the reporter, may or may not be just, and are therefore not evidence. Their correctness or relevancy to the case will be elicited in the cross-examination. As a rule, nothing should be entered in a report which is not connected with the subject of inquiry, and which has not actually fallen under the observation of the reporter. The introduction of hearsay statements—*i.e.*, statements made by others, or of circumstances which have come to his knowledge through public rumour—should be carefully avoided.

In the case of M'Lachlan, who was tried for the murder of Jessie M'Pherson (Glasgow Aut. Circ., 1862), some discussion arose upon what should and what should not find a place in a medical report. A report was put in at the trial in which the surgeon of police, who had been authorised to make a post-mortem examination of the body of deceased, stated, in commencing his report, that the body had been found "*under circumstances of great suspicion*," in a front room, etc. The judge remarked that this was matter which was not suitable to a medical report. So again, in reference to the conclusions drawn, the first and third were as follows:—

1. "That this woman" (the deceased) "was *murdered*, and that with extreme ferocity."

3. "*That a severe struggle had taken place before death.*"

The suggestion of murder was an anticipation of the verdict of the jury. The conclusion should simply have been that death was caused by such and such injuries. There was no evidence of conflict or struggle as far as the mere post-mortem examination went. The facts upon which the witness relied as evidence of a struggle were equally consistent with the dragging of the body after death.

In a medical report of an analysis in a case of suspected poisoning, it is not necessary that all the details of an analysis should be entered. A general statement of the results, to the effect that certain tests and processes had been used, will be sufficient. In the various analyses connected with the case of Cook and Ann Palmer (*Reg.* v. *Palmer*, C.C.C., May, 1856), an application was made to Dr. Rees and the

author to give to the prisoner's attorney, before the trial, a statement of the whole of the details of their analysis of antimony and strychnine. They declined to do this without authority. The Queen's Bench was appealed to, and Lord Campbell decided that there was no legal ground on which such a demand could be enforced. Considering that the medical evidence against the prisoner was clear and conclusive, the counsel for the Crown advised that they should concede the point, although admitted to be neither in accordance with law nor custom. Upon this advice they acted, but it is not a course to be recommended to any scientific witness to follow in a future case. The result was that, before the trial, these memoranda were placed in the hands of some chemists retained for the defence, with a view to hostile criticism. Portions of them appeared in a garbled, fragmentary, and incorrect form in some journals and newspapers, with comments attacking the processes and conclusions before their evidence had been given. It was well known that, under the circumstances, the witnesses for the Crown were precluded from making any reply or giving any explanation. No medical man is called upon to lay himself open to attacks of this nature, or to furnish materials for a cross-examination to "medical counsel" acting in the interests of a prisoner. In regard to the chemical research for poisons, chemists generally differ about the process which it may be desirable to pursue in a given case; and although the same result may be reached by various methods, it is by no means difficult to find one who will assert that his is the only correct process, and that all others are fallacious, or to raise by such counter-statements that kind of doubt in the minds of a jury which may lead to the discrediting of a witness's results.

PASSAGE OF A REPORT OR DEPOSITIONS FROM COURT TO COURT.

In this country cases of murder are almost invariably, and acts of criminal violence very frequently, inquired into in three courts. In the former case the coroner is required to inquire "when, where, and by what means the victim met with his death"; this may, or may not, result in a verdict that some person or persons are responsible. If it does, then the accused comes before a magistrate, and may be found guilty or not guilty; if the latter he is then tried at the assizes, or highest criminal court of the district. In the latter case, of crimes less than murder, the accused may be tried first by a magistrate and then by a judge in a higher criminal court, and subsequently the evidence given may be brought before the Home Secretary, or some other indirect means of appeal.

It is, therefore, very necessary that a medical witness should remember that copies of his report and depositions,[1] either before a coroner or magistrate, are usually placed in the hands of counsel as well as of the judge, and that his evidence, as it is given at the trial,

[1] Depositions, as they are termed, are merely a written copy of evidence given orally. They should be always read by, or to, the witness before he signs them. It is therefore easy for him to correct any error which may have crept into the document by reason of the ignorance or neglect of the coroner's or magistrate's clerk.

is compared word for word with that which has been already put on record. There is reason to believe that this is not generally known to members of the medical profession, and thus it happens that either from failure of memory, want of accurate observation, or carelessness in giving evidence at coroners' inquests, medical witnesses lay themselves open to severe censure, either by stating matters differently at the trial, or by giving a very different complexion to the facts. Any serious deviations from what is on record will of course tell unfavourably for the witness, supply materials for a severe cross-examination, and form an excellent ground of defence for the prisoner. The witness's weakness is the prisoner's opportunity, and of course his counsel will not lose the occasion of impressing upon the jury that a man who can on oath give two different accounts of the same transaction is not to be believed on either.

The proceedings at coroners' inquests are treated too lightly by medical men. The ignorant and uneducated class of persons who often constitute the jury, as well as the circumstances under which the inquiry usually takes place, are not calculated to inspire great respect for these initiatory proceedings; but still by law and custom coroners' inquisitions are, and have been for ages in this country, the primary tribunals for inquiring into and determining the cause of death in cases of suspected violence; and they are therefore deserving of more attention than is usually shown to them by medical witnesses. The observations elsewhere made in reference to inquests in alleged child-murder apply to all other cases demanding medical evidence. As a rule, in all inquests which are likely to end in a committal of the accused person, a medical man who is giving his evidence before a coroner, usually in the room of a small inn, is virtually delivering it before a judge of assize; and this fact alone, if not a respect for the court, should induce him to give the evidence guardedly, and with a due consideration for the serious results to which exaggerations or misstatements may ultimately lead.

CORONERS' INQUESTS.

Coroners' inquisitions are so intimately associated with the practice of medical jurisprudence in reference to criminal cases, that it is impossible to pass over this subject without pointing out what must be regarded as the defects of this method of inquiry. The Coroners Act, 1887 (50 & 51 Vict. c. 71, s. 1), directs that "where a coroner is informed that the dead body of a person is lying within his jurisdiction, and there is reasonable cause to suspect that such person has died either a violent or an unnatural death, or has died a sudden death of which the cause is unknown, or that such person has died in prison, or in such place or under such circumstances as to require an inquest in pursuance of any Act, the coroner, whether the cause of death arose within his jurisdiction or not, shall, as soon as practicable, issue his warrant" for an inquest; and the Lunacy Act, 1890 (53 Vict. c. 5, s. 84), directs that "every coroner shall, upon receiving notice of the death of a lunatic within his district, if he considers that any reasonable suspicion attends the cause and circumstances of the

death, summon a jury to inquire into the same." The information upon which a coroner generally acts is (1) notice from a beadle, or other officer of the parish (whose zeal is sometimes stimulated by a fee or salary), of any death from sudden or supposed unusual causes; (2) notice from a medical man who may have attended the deceased, and who communicates his suspicion that the cause of death is not natural; (3) notice from a registrar of deaths that no cause has been assigned in a particular case, or that there has been a rapid death after a short illness. In the above quotation it would seem to the ordinary mind that the word lying was as unambiguous as a word could be, and yet in the *Lancet*, vol. 2 for 1899, p. 1531, will be found a leader on a case in which a coroner expressed his opinion that an inquest should be held in the district where the victim died. The same leader calls attention to the trouble, annoyance, and expense that may arise by a strict observance of the letter of the law; not only that, but it quotes a case where a criminal might have got off on a technical plea that a particular coroner had no jurisdiction to commit him.

Apart from any difficulties of jurisdiction which may thus arise, the conclusion to which experience leads in reference to these inquiries is, that the system affords no certainty for the detection of crime; that it affords no protection to those who are wrongly charged with crime; and, lastly, that in some cases it screens a criminal by a verdict based upon an imperfect inquiry, in which the important medical facts are either not understood or are misinterpreted by the jury. No preliminary test of ability or capacity is required of the coroner, although the Coroners Act, 1887, states that he shall be a "fit person." A remarkable illustration of this statement was furnished, in reference to an inquest held in Suffolk, in September, 1867. A druggist applied to the ulcerated breast of a woman suffering from cancer *thirty grains* of morphine in powder. The woman was soon afterwards seized with the symptoms of poisoning by morphine in a severe form, and she died in ten hours. The druggist, when examined at the inquest, admitted that he had applied this large quantity of a powerful poison, and in his judgment it was a right and proper application. There was medical evidence that the woman had died from poisoning with morphine by absorption, on which fact there could not indeed be two opinions. The coroner summed up the case, and the jury returned a verdict of "Death from natural causes."

Admitting that a great many crimes (which might otherwise have remained concealed) have been brought to light by this system, it fails nevertheless, as the inquiry is now conducted, to exercise much deterrent influence on criminals. And why? The answer is simple. (1) In a large proportion of cases there is no post-mortem examination of the dead body by a qualified medical man; (2) in a small proportion even of those autopsies which are made the cause of violent death may be overlooked through the want of familiarity of the inspector with the signs of a violent death, or with the steps necessary to be taken in a medico-legal inquiry; (3) again, the verdicts of coroners' juries are not infrequently ridiculous, and quite contrary to the medical evidence; (4) and, lastly, it is by no means unknown for a coroner to call no medical evidence whatever.

1. **No Autopsy.**—It may be said at once, and emphatically, that an inquest without a most careful external and internal examination of the body is a vain mockery, fit only for comic opera, and the sooner the public mind is imbued with this idea the better for society. It is not to be implied from this statement that an inquest should be held on the bodies of all persons who die suddenly. A large proportion of sudden deaths take place from well-known natural causes, easily elicited by a proper medical inquiry, and they strictly demand no judicial proceedings, and yet there is a popular notion that it is only sudden deaths that require an inquest, quite ignoring the fact that in all cases of slow or chronic poisoning the person has lingered on with intermitting symptoms, and death has taken place only after an illness of some days' or weeks' duration. There is no provision for the detection of such cases. Their discovery appears to be a matter of accident.

If circumstances of the nature of an accident or of a suspicious character justify an inquest, *ipso facto* there should be an inspection. Even taking the most obvious case of the apparent cause of death, such as a machinery accident, who can tell without a post-mortem whether the victim may not have slipped from a small bleeding into the brain, and thus the accident itself have been due to disease for which no one was to blame? For an excellent illustration of the use of an autopsy (*vide B. M. J.*, 2, 1903, p. 95), where a woman swallowed a corrosive and was almost immediately run over fatally by a tramcar. The reason alleged for the absence of an autopsy is usually that of expense, a reason which is certainly not worth the ink required to write it down, and if expense be a possible deterrent, let the expense be saved of the very numerous unnecessary inquests which are now held every year in London alone. Of the absolute folly of holding an inquest without an autopsy not a week passes but that an example arises, but the following from Dr. Taylor's own experience is too excellent to be omitted:—

> The author was once an attendant at a funeral; it was delayed, and the cause of the delay was this:—An inquest had been held on the body (a case of very sudden death in a state of health), and a verdict of "Death from disease of the heart" had been returned. There had been no inspection of the body. When the grave-clothes were removed, and the body was examined, it was found to be covered with bruises, and some of the muscles of the thigh were found reduced to a jelly by blows. Death had been clearly caused by violence. But an inquiry before a coroner for two days had, with all the usual formalities of medical evidence, etc., resulted in a verdict of "Death from disease of the heart." Within two hours only of the body being put into the ground, it was clearly proved to be an act of murder or manslaughter. The guilty party was tried, convicted, and punished (*Reg.* v. *Hopley*, Lewes Aut. Ass., 1860).

A case that occurred a few years ago at Bootle is also an excellent illustration; without the autopsy the very gravest aspersions on a teacher might have been persisted in, for the symptoms were medically very misleading indeed:—

> At the Bootle Police Buildings, Mr. S. Brighouse, county coroner, held an inquest on the body of Rose Murphy, aged seven years.
>
> It seems deceased resided with her parents at Olivia Street, Bootle, and attended St. Alexander's Schools, St. John's Road, Liverpool. At four o'clock on the 11th inst. the child returned home from school. She was crying, and her

mother, noticing this, questioned her. The child told her that she had a pain in the head, which she said was caused by the teacher striking her with a cane for looking at her boots. The child was put to bed, and on the following day she complained of pains in the head. A doctor saw deceased, and she was treated in the ordinary manner. On the 19th inst. she again complained of pains in the head, and on Friday morning last was seized with convulsions and died.

Dr. A. R. Wilkinson said he was called in to see the child on the 14th inst. She was suffering from acute pain in the head, and had been vomiting. He treated her for the same, and she apparently recovered. He had made a post-mortem examination in company with Dr. Hinds. No external marks of violence were found, and the organs of the body were normal with the exception of the stomach, where a perforating ulcer was discovered. That accounted for the pains and the vomiting. There was no evidence of any injury having been inflicted on the child. Dr. Hinds concurred with the conclusions he arrived at. In reply to Mr. Yates, who represented Miss White, the teacher, he said if any violence had been used the marks would have been present after death.

Miss Miriam White, an assistant teacher in the infants' department of St. Alexander's School, said she had known deceased for some time. During the whole time she was in her (witness's) charge she had never touched her. Deceased was a good child, and witness reiterated that she was perfectly certain that she had not corrected the child by striking her on the head with a cane.

Mr. Yates pointed out that this statement was made by a child only seven years old, and it might prove very injurious.

The Coroner said he understood the difficult position in which the teacher was placed. This child was known to have knocked its head against a nail behind the door in the house, and was probably afraid to tell the true cause of the pain in the head.

The jury returned a verdict of "Natural causes," and passed a vote of sympathy with Miss White.

The Coroner said that he and the jury were of the opinion that the teacher had done nothing to the child, and that no bad treatment had been administered.

Again, in the following case that occurred to Dr. Nelson Hardy, what could have been decided without an autopsy?—

"On August 7th, 1903, I was asked by a constable to go to a house where his father and mother lived, and there shown the body of a woman aged about sixty-five, lying in bed, quite dead. She was a friend of the family who had been taking charge of the house during the absence of the family, including the constable, at the seaside. Most of the family were still away, but the constable had returned the previous evening and had supper with the deceased, who did not complain of feeling ill, and had not, as far as he knew, seen any doctor. As she did not come down at her usual hour next morning, he went up, and found her dead. I found the body still warm and rigor mortis just commencing, both feet bandaged for sores, but nothing to account for death visible.

"*Post-mortem made August 8th.*—Cadaveric discoloration over the entire abdomen, sores on both feet, no external mark of injury or violence. On opening the chest, extensive double pneumonia and pleurisy were found, effusion into the pericardium, and right side of heart full of blood-clots. Other organs healthy."

"At the inquest on August 11th a verdict in accordance with the medical evidence was returned."

2. **The Non-familiarity on the part of Ordinary Medical Men with Post-mortem Appearances of the various Causes of Death,** natural or violent, and with the steps necessary to be taken in a medico-legal inquiry, is a matter very closely affecting the medical evidence given before coroners, and one which has during the past year or more (1903) given rise to a good deal of acrimonious discussion (*vide B. M. J.*, 2, 1903, pp. 1675 and 864), more perhaps by the manner in which coroners have attempted to overcome the difficulty than from a wounding of the *amour propre* of the general practitioner by the statement of the fact that he cannot, from the mere nature of his

professional duties alone, be expected to be familiar with all the niceties of pathology which legal medicine might at any moment demand from him.

The steps necessary for the proper identity and preservation of viscera or other articles for analysis are often neglected. The stomach is cut open, and the contents lost. The stomach containing poison is thrown into the same vessel with other viscera, and thus all are impregnated with poison. Evidence of absorption and diffusion of poison through the body during life is thereby entirely destroyed. Stomachs have been sent for analysis wrapped only in brown paper. On one occasion two stomachs (of children poisoned) were sent in bladders unlabelled. The identity of these at the subsequent trial for murder could only be made out by the different colour of the string with which one bladder was tied. On another occasion, in a newly papered room in which a body was examined, the stomach was wrapped in a portion of the paper-hangings lying about; these, as it happened, were coloured with an arsenical pigment, and the poison was thus transferred from the paper to the stomach.

The selection of the nearest medical man, or of any gentleman who will make an inspection and analysis for the statutory fee (*vide* "Fees") of two guineas, in a case of murder by poison, often leads to a large expenditure subsequently for a further analysis before the trial, when the parts in which the poison would be most probably found have been destroyed. On such occasions it is the custom to condemn severely the medical and chemical gentlemen, who have probably, for the first time in their lives, undertaken a case of this serious nature upon the express order of a coroner, with insufficient remuneration for its performance. This is manifest injustice. The fault is in the system, and not in the men, who do their utmost to perform a difficult duty, for the first time, as well as they can.

If a coroner places the inspection of a body in the hands of one who is not well skilled in the appearances produced by poison or disease, it is obvious that a serious mistake may be committed, which may implicate an innocent person. If he places a stomach for analysis in the hands of an inexperienced analyst, it is not the fault of the analyst (whose living depends on his practice) if he undertakes it, and falls into some grievous act of omission or commission.

The twenty-first section of the Coroners Act, 1887, does, however, provide some remedy for the evils which were formerly rife. It enacts that "if a majority of the jury sitting at an inquest are of opinion that the cause of death has not been satisfactorily explained by the evidence of the medical practitioner or other witnesses brought before them, they may require the coroner, in writing, to summon as a witness some other legally qualified medical practitioner named by them, and further to direct a post-mortem examination of the deceased, with or without an analysis of the contents of the stomach or intestines, to be made by such last-mentioned practitioner, and that whether such examination has been previously made or not, and the coroner shall comply with such requisition."

There is for these defects a further simple remedy, which is often now resorted to by coroners in cases demanding great medical and scientific skill—in other words, the evidence of *experts*. The necessity

of employing experts, more especially in supposed cases of poisoning, is now generally admitted. A coroner has only to make a representation to the Home Secretary giving satisfactory reasons why an analysis is needed, and an expert is appointed at no cost to the coroner. Some coroners, though aware of this privilege, are, nevertheless, unwilling to avail themselves of it; and an instance is known of a coroner insisting on an analysis being made by a local practitioner, in spite of his declared inability to make an analysis. It was the calling in of an expert to make the autopsy, in all cases, which caused the trouble mentioned above, and yet, apart from personalities and fees, there can be no question but that the principle of so doing is the correct one (*vide Lancet*, vol. 2, 1902, p. 755). The editor has within his own personal experience known cancer of the gut causing perforative peritonitis to be overlooked, and *per contra* the flexion of the terminal phalanges of the fingers, found in a baby that had been packed in a bandbox for six months, adduced as strong evidence of a death from strangulation on such a long antecedent date. The necessity for appointing a skilled independent inspector of bodies in all suspected cases demanding inquiry will be apparent from other considerations. Palmer, a medical man, was thus allowed to be present at the inspection of the body of Cook. He nominated the persons, one of them an inexperienced young man who had never before inspected a body in a case of death from poison, and he stood over them while they were engaged in the office. The stomach of the deceased when received for analysis was cut open throughout its length. The injury to this organ, by which at least a portion of the contents was lost, occurred during the inspection, and is said to have arisen from Palmer having accidentally, as it was alleged, pushed against the youth who was making the inspection. After the viscera had been placed in a jar and secured with a bladder, Palmer found an opportunity of cutting the bladder with a knife and inverting the jar, and this probably led to a further loss of the contents. In another case of exhumation, the viscera had been carefully removed and placed, as it was supposed, in separate jars, which were properly secured and labelled. When the jar labelled "Stomach and Contents" was opened by the analyst to whom it had been sent, it was found empty. From inquiries subsequently made, there was but little doubt that a person who was interested in preventing an analysis was permitted to be present at the inspection, and that he had taken the opportunity, when the inspectors were otherwise occupied, of removing the stomach from the jar and again secretly returning it into the abdomen before the body was sewn up, or otherwise disposing of it. Acts of this kind would perhaps be impossible in the present day, but the best security against their occurrence would be the appointment of a skilled inspector in a district to conduct all post-mortem examinations for coroners' inquests. In Scotland a very rigid rule is in existence, that no one shall be present at the autopsy except the official inspector, this extreme practice leads to some injustice (*vide B. M. J.*, 2, 1899, p. 819).

A charge of malapraxis is sometimes raised against a medical man in consequence of the death of a patient. The examination of the body may, by order of a coroner, be unknowingly placed in the hands

either of a professional rival, or of a friend of the person inculpated. This is not just either to the practitioner or the public. There is nothing more easy, medically speaking, than to exaggerate appearances in a body, or to assign to the action of medicines, or to the use of surgical instruments, post-mortem conditions to which an independent and experienced anatomical inspector would probably attach no importance. Supposing the question to be that a patient has died from an overdose of opium, said to have been found in the stomach—if the analysis has been entrusted by a coroner to any professional rival, or to an incompetent analyst selected by him, the injury done may be irreparable. Such cases have occurred, and must occur until special inspectors are appointed in place of men who are now taken by chance, by the fact of their living in the vicinity or of their being called to see the person while dying.

If a person has had poison administered to him feloniously, and he recovers, the facts of the case, if investigated at all, are duly investigated by a magistrate, the evidence is carefully sifted, analyses may be properly made when required, and the depositions are so drawn up as to form a correct basis of proceedings for the trial of the accused. If, however, the person dies from the poison, the case then goes before a coroner and a coroner's jury; and although the medical and other questions which arise are usually of greater importance, they are now dealt with by men frequently incompetent to understand them, and who are not always qualified to elicit the facts or put them into a proper shape for trial. Hence it is that, unless a true bill has been found by a grand jury at the assizes, or the alleged criminal has been committed by a magistrate, no prosecution is commonly instituted. The proceedings taken before a coroner are in this case disregarded.

3. **That the Verdict of a Coroner's Jury is often given irrespective of the Medical Evidence,** and sometimes even absolutely in contradiction to such evidence, is sufficiently illustrated by the case quoted above, p. 16.

4. Lastly, **the calling of no Medical Evidence** is nothing less than a public scandal and a practice which perhaps more than any other has brought coroners' inquests into their present disrepute, and yet scarcely a month passes but that a case is reported in the medical journals in which this absurd course has been pursued. One such within the editor's personal knowledge occurred in a large town near London quite recently.

A man was found in an outhouse quite dead but warm. His right trouser leg was pulled up to the knee with the drawers and the right stocking pulled down. There was a clean cut across a varicose vein, from which he had *primâ facie* evidently bled to death. A bloodstained razor was lying near his right hand. No medical evidence was called, but a verdict of accidental death was recorded, probably the only verdict which it was utterly impossible could have been the correct one.

Tried and competent men only should be appointed as coroners, and in place of a jury they should have the assistance of persons skilled in a knowledge of the causes of death and in conducting post-mortem examinations and analyses. For these reasons and for many others (*vide* Lowndes' "Reasons why the Office of Coroner should be Held by a Medical Man," 2nd ed., Churchill, 1895), the office itself should be

held by a medical man of good education and position. Such a case as the following would then be impossible :—

A man was taken dead into a hospital at which he had attended as an out-patient more than six months previously. The coroner asked the house surgeon to give his opinion as to the cause of death without making a necropsy. This he declined to do, whereupon the coroner directed the jury to find a verdict without medical evidence (*Lancet*, 1904, p. 1427).

For another case in which no medical evidence was called, *vide B. M. J.*, 2, 1903, p. 1186.

Under the present system coroners are empowered by the Coroners Act, 1887, to issue an order for the attendance of any legally qualified practitioner. A fee of two guineas is the maximum allowed for making a post-mortem examination, giving evidence, and, if considered necessary by the jury, making a chemical analysis of the stomach and intestines; unless the Home Secretary orders an analysis by an expert. A penalty of five pounds is attached to disobedience of this order except for reasonable cause. Rumsey has correctly represented the unsatisfactory position in which medical men are placed by such an arrangement. He observes : "It is no discredit to a practitioner engaged in the toilsome routine of ordinary medical duties if he should feel himself at a loss when called upon for a decisive opinion in some obscure case of poisoning or infanticide. His scanty opportunities for the study of these subjects and for making post-mortem examinations cannot suffice to qualify him for answering the delicate and important questions which he must answer before a jury can find a proper verdict. . . . The custom of indiscriminately summoning medical practitioners of all sorts and of all degrees of pathological knowledge and forensic skill has sadly depreciated the value of medical evidence in courts of justice. Public confidence in the profession has been shaken, and the appearance of a 'doctor' in the witness-box is but too often a signal for sport among gentlemen of the long robe" ("Essays on State Medicine," p. 356). There appears to be no fee for attendance at an adjourned inquest.

No man can be compelled to undertake that which he feels incompetent to perform, and medical practitioners who have felt this want of experience usually decline to make chemical analyses involving so serious a responsibility. It is thus that, in many cases of importance, analyses for coroners' inquests are now referred to chemical experts, and the practitioner discharges himself of that responsibility which, without any adequate remuneration, the Coroners Act, 1887, imposes upon him.

After a coroner's inquiry, the whole of the proceedings are sometimes directed to be reheard before a magistrate or magistrates, who can analyse and sift evidence, and can bring the minds of educated men and trained lawyers to bear upon the facts. A proper analysis and inspection are then made, and the case in this complete form goes before an assize court for trial. If this is done occasionally in cases of importance, why not in all cases that are now properly the subjects of a coroner's inquiry? Let a well-trained gentleman be appointed as a stipendiary judge in every county or borough; let him, upon the same sources of information as are now open to the coroner, hold inquiries or not, according to his judgment. There are many coroners who are

quite competent to fill such an office. In each county, or district there should be appointed a surgeon skilled in the inspection of the dead body and in a knowledge of the causes of death, and a chemist skilled in the processes for the detection of poisons. To these three officers, and, if necessary, to assistants appointed by and under them, all inquiries into crimes connected with the death of persons should be exclusively remitted. Proper salaries for skilled surgeons and analysts would secure competent men, and probably turn out in the end to be less costly than the present system.

Some such regulations as these must sooner or later be made if the public desire to have the duties of an important office properly performed. The value of life is said to be greater in England than in any other country; but this remark applies only to cases of crime which are actually detected, and to the prosecution and punishment of criminals. We are greatly inferior to France and Germany in our means for the scientific detection of crime and murder by secret poisoning. In the case of Palmer (1856), there was evidence to show that his wife, his wife's mother, two of his children, his brother, and one of his personal friends, had all died from poison under his roof within two or three years before the death of Cook, for the murder of whom Palmer was tried and convicted. His wife had been poisoned by tartar emetic, and his brother by prussic acid. The deaths of at least two others in his house were probably violent. Where was the coroner's inquest for the protection of life? The initiation of proceedings is often placed in the hands of a police-constable or a coroner's beadle, instead of being directed by the Public Prosecutor.

In Scotland, the office of coroner does not exist; but in place of this there is an officer named procurator fiscal, generally a skilled solicitor, nominated by competent authority, and not elected by scot and lot voters. The general order issued to these officers by the Lord Advocate enjoins that in cases where a dead body is discovered the procurator fiscal shall obtain a medical report of the cause of death; and in cases of persons found dead the body is generally inspected for this purpose. This, however, is at the option of the appointed officer, the instruction being in these words: "Wherever, in his opinion, a written medical report is necessary for the due consideration of the case, he (the procurator) shall obtain such a report from a duly qualified medical practitioner." The usual practice in England is to select the *nearest* medical practitioner, whether he has had any experience or not, and often to trust an important chemical inquiry in the hands of one who probably has never before made an inspection or an analysis for poison.

In France, the officer corresponding most nearly to our coroner is the *procureur*, or attorney of the republic, who is also a kind of local public prosecutor, and is a lawyer. On receiving information, he makes the necessary investigations, and draws up a report. He is assisted by a medical officer or officers, chosen for superior medical and surgical knowledge; and he may also call in the aid of experts. The system is said to be effective; for whilst the presiding officer is a lawyer, he has a medical assessor, medical testimony is obligatory, and the interests of the public and of the medical profession are guarded.

In Germany, an inquest is solely an affair of the police, and there

is neither coroner nor analogous officer. There are, however, distinct judicial medical officers, regularly appointed and selected for their special training and fitness for forensic duty. On the summons of the district attorney they examine dead bodies, make post-mortem examinations, and report on the medical examination.

A very satisfactory system of holding inquests has been adopted by the State of Massachusetts, and is said to work well. Coroners and juries are wholly dispensed with on the preliminary examination. A competent medical man is duly appointed, in consequence of his fitness, to the post of district medical officer. He inspects the corpse; and if, on such examination, he thinks further examination necessary, he is required by the district attorney to make a post-mortem examination in the presence of two witnesses, and makes his report. If it is to the effect that death resulted from violence, the case is then investigated by the local public prosecutor. The medical officer is empowered to call in the aid of the chemist. To guard against negligence and fraud, if the examiner report that the death was not caused by violence, and the legal authorities are of a contrary opinion, they cause an inquest to be held in a prescribed manner.

A Coroners Act Amendment Bill is being pressed forward by the British Medical Association.

A SUBPŒNA.

This is the recognised method by which a medical witness is summoned to give evidence before all courts. Occasionally he does attend before a coroner without it, but this action is a very inadvisable one. When a subpœna is served upon a medical witness, reasonable travelling expenses for reaching the scene of the trial must be tendered with it; if this is done the witness is bound to attend on a subpœna, but not otherwise. Should a medical witness attend court without a subpœna, he should take care that he gets *in writing*, from the person who requests his attendance, satisfactory assurances with regard to his fees. The neglect of this simple precaution often leads to much disappointment and inconvenience, if nothing worse. Without a subpœna, or without some written contract as above, no witness is bound to appear.

The editor has frequently been asked questions relative to the authority which a subpœna carries. The following cases and decisions will be seen to cover the whole ground in this respect. The most recent one in 1904 seems to uphold the others.

In *Betts* v. *Clifford* (Warwick Lent Ass., 1858) Lord Campbell stated, in answer to a question, that a *scientific witness* was not bound to attend upon being served with a subpœna, and that he ought not to be subpœnaed. If the witness knew any question of *fact* he might be compelled to attend, but he could not be compelled to give his attendance to speak to matters of *opinion*.

In *Rich* v. *Pierpoint*, an action for malapraxis, Lee was summoned against his will to give evidence on the part of the plaintiff. He stated that on the evening before the trial a solicitor called on him and left a subpœna with him. Lee would not hear any account of the case which the solicitor proposed to give, and expressed his resolution to have nothing to do with the trial. The solicitor informed him that he

would be required to pay the usual penalty if he did not attend. He went to Kingston, and was warned not to leave the court until the trial was over. He heard the evidence on the part of the plaintiff, and upon [this and the medical evidence he gave his opinion, not much in favour of the party who summoned him and not much against him. Lee considered that he could not avoid attending the trial under these circumstances (*Med. Times and Gaz.*, 1862, 1, p. 389).

In the case of *Webb* v. *Page* (Carrington and Kirwan's Rep., p. 23) Maule, J., ruled as follows:—"There is a distinction between the case of a man who sees a fact and is called to prove it in a court of law and that of a man who is selected by a party to give his opinion on a matter on which he is peculiarly conversant from the nature of his employment in life. The former is bound, as a matter of public duty, to speak to *a fact* which happens to have fallen within his own knowledge; without such testimony the course of justice must be stopped. *The latter is under no such obligation;* there is no such necessity for his evidence, and the party who selects him must pay him." In the case referred to a skilled witness had been subpœnaed, but refused to give evidence unless first paid for his services and loss of time (*Med. Times and Gaz.*, 1862, 1, p. 432). A barrister, who quotes this ruling, goes on to say: "There is one reason why I should not advise any person in the position of a skilled witness totally to disregard a subpœna. It is quite clear that should such a person fail to attend a trial no attachment could issue, even if he were called, as is usual, upon the subpœna, because the party subpœnaing him could not make the requisite affidavits that he was damnified by the witness's absence, and in what respect. But such party might bring an action for damages; and although he would recover none, he might not only worry, but might even put the defendant to a considerable expense, as taxed costs by no means include the entire costs in such cases. Although, therefore, I could not advise a total neglect of the subpœna, the safest course would be to obey it, and demand expenses before giving evidence. Such expenses would be only those allowed for a professional witness (not special fees); but if the person so subpœnaed were willing to run the risk of an action, he might safely absent himself without any fear of an attachment from the court for contempt." With regard to the question whether a skilled witness would be permitted to demand a high fee for his attendance under such circumstances, the writer adds: "To permit him legally to demand a high fee would perhaps look somewhat like legally countenancing a bribe." At all events there is no such legal recognition. A witness subpœnaed to depose as to facts cannot refuse to give his experience as to these or any other facts of the case.

In the case of *Maxsted* v. *Morris* (Court of Exch., May, 1858), a witness wilfully disobeyed a subpœna. In consequence of this the trial was postponed, and the parties were put to great expense. An arrangement was made by which the witness bound himself to pay a part of the expenses. The Chief Baron said: "It will be distinctly understood that in all cases where it appeared to the court that there had been a wilful disobedience of a subpœna after proper service such a contempt of court would be visited with the punishment it deserved." Martin, B.: "It was not to be tolerated that a man should exercise

any discretion as to whether he would or would not attend a court in pursuance of a subpœna. Enormous costs were incurred in preparing a case and in bringing it down to trial, the whole of which were to be thrown away and wasted because a man refused to obey a lawful summons to attend as a witness." Pigott, B.: "A subpœna was not to be treated as mere waste paper. Public justice required that persons wilfully committing contempt of court should be dealt with in such a manner as to teach them that they could not commit a contempt of court with impunity." The following is taken from the morning press of June 28th, 1904:—

The Board of Trado brought a test case at Grimsby yesterday against Giles Mills, a superintendent engineer, who failed to attend an inquiry into a boiler explosion on the Grimsby trawler *Helvetia* after having been duly summoned, and tendered one guinea conduct money. The defence urged that the issue was of vital importance to all professional engineers. Defendant regarded a guinea as utterly inadequate for expert evidence, and contended that his abstention from the inquiry was therefore justifiable. As a professional man he was entitled to from three to four guineas a day. For the Board of Trade it was contended that no subpœna could be disregarded on the ground of insufficient allowance; dissatisfied witnesses could apply to the taxing master. The Bench expressed the opinion that defendant had set the Board of Trade at defiance, and imposed a penalty of five pounds, including costs, or one month's imprisonment in default.

The question may not be one of fees, but of obedience to a simple order to attend and give evidence on matters of *opinion* irrespective of scientific facts. In a case before Wood, V.-C. (*Simpson* v. *Halliday*, 1864), the author was required to attend on a subpœna as a skilled witness to give evidence of *opinion* in reference to the alleged infringement of a patent. The defendant, who summoned him, did not make it in any way a question of fees; but being wholly unacquainted with the facts of the case, he did not feel in a position at a short notice to appear as a witness for parties of whom he knew nothing. The author obeyed the subpœna, as the disobedience of it might have been, in the uncertain state of the law, a contempt of court, and, after giving evidence, requested his Honour to state for future guidance whether a skilled witness was compelled to attend under such circumstances as those in which he had attended, and referred him at the same time to the decision of Lord Campbell in *Betts* v. *Clifford*. The Vice-Chancellor said that a court of law never gave an opinion on a speculative question, and there the matter ended.

It would seem therefore that a skilled witness, who is not acquainted with *any of the facts* of a case, may be compelled by a subpœna to attend and give evidence on a matter involving scientific opinion alone. Some months before this occurrence the author had given evidence in a similar case, and the defendant, seeing that his opinion in that case was favourable to his views, exercised a right to impound his services. When some portions of the public press undertake to censure experts for acting as hired witnesses, it may be as well to remember that they may be sometimes unwillingly forced into court by subpœnas which they dare not disobey.

Lord Campbell's dictum in reference to the distinction between fact and opinion confers no practical benefit on witnesses. It is at all times difficult in science, and in the medical sciences particularly, to separate them; and if a man appears to testify to a medical or

scientific fact, he cannot avoid giving an opinion arising out of the fact. In an action against a druggist for a mistake in compounding medicine an attempt was made to procure the author's *opinion* as a skilled witness at the trial by reason of *facts* obtained from the report of a chemical analysis, the object of which was at the time entirely concealed from him. The suit was compromised, and his attendance was not necessary; but such a case should convey a caution to chemical experts. They may be employed secretly and under untrue statements to make analyses; these become *facts* on which they may be summoned like ordinary witnesses to give *opinions* as skilled witnesses, while the payment of the usual fee for a skilled witness is evaded.

A medical man may be placed in the disagreeable position of receiving separate subpœnas to attend trials at different courts which are held at or about the same time. An obedience to both of them is clearly impossible; one at least must be sacrificed to the other. On one occasion the author was called from a civil trial which had commenced in the Assize Court at Durham to a criminal trial which was fixed to take place on the same day at Lincoln. The civil case was postponed, and he had so far the benefit of the opinion of one of the most learned judges on the Bench that in all cases in which there were served separate subpœnas fixing trials for the same time the civil should give way to the criminal case. The former can be postponed; the latter cannot. But if the subpœnas are for two criminal cases, the course of a witness should be to attend to that in which the subpœna was first served upon him.

TAKING THE OATH.

By the Oaths Act of 1888 a witness is allowed to be sworn in the Scotch method with uplifted hand, and yet so conservative are all minor officials of the law that even now (1903) the clerk of the court will ask a witness "to kiss the book." It is advisable on every ground not to do so, but immediately on stepping into the box, let the witness lift up his right hand, and deliver in a firm and audible voice the prescribed oath, "I swear by Almighty God, as I shall answer to God at the last day of judgment, I will tell the truth, the whole truth, and nothing but the truth."

This matter would seem unimportant were it not that as late as 1902 the knowledge of the Act would seem not to have penetrated to our West Indian colonies (*Lancet*, vol. 2, 1902, p. 165), and yet it should be known everywhere. Whatever the particular religion of the witness may be, or rather his views upon religion, these solemn words certainly should penetrate to the bedrock of his conscience; at any rate, even if he have no conscience, they effectually render him liable to the law of perjury.

EVIDENCE.

By the Criminal Evidence Act of 1898 a prisoner can now be put into the box and can give evidence on his or her own behalf. The pros and cons of this have no medical interest.

Evidence given before a court is of two kinds : (1) oral ; (2) documentary. We must deal with the former first, and at some little length, as it is the commonest kind, and, in the majority of cases, the only form in which medical evidence is given.

Some medico-legal writers have considered it necessary to lay down rules respecting the manner in which a medical witness should give his evidence, how he is to act on cross-examination, and in what way he is to recover himself on re-examination. Any advice upon this head appears to be superfluous, since experience shows that these rules, like those given to prevent drowning, are invariably forgotten at the very moment when the individual is in the situation in which he most requires them. A man who goes to testify to the truth to the best of his ability should bear in mind two points : (1) that he should be well prepared on all parts of the subject on which he is about to give evidence. Let him remember on these occasions the advice contained in the Latin motto, *Ne tentes aut perfice*. (2) That his demeanour should be that of an educated man, and suited to the serious occasion on which he appears, even although he may feel himself provoked or irritated by the course of examination adopted. A medical witness must not show a testy disposition in having his professional qualifications, his experience, his means of knowledge, or the grounds for his opinions very closely investigated ; he should rather prepare himself to meet with good humour the attempts of an adverse counsel to involve him in contradiction, and show by his answers that he has only a desire to state the truth. Law and custom have long established that a barrister, in defending a prisoner charged with murder, has a right to make use of all fair, and even what may appear at the time to the witness unfair, means for the defence. Nothing can tend more to lower a witness in the opinion of the court and jury, or diminish the value of his evidence, than the manifestation of a disposition to deal with his examiner as if he were a personal enemy, to evade the questions put, or to answer them with flippancy or anger. All such exhibitions invariably end in the discomfiture of the witness. It has been suggested that medical men on these occasions might take a lesson from lawyers, and observe how little they allow forensic differences, which they put on with their professional costume, to influence them in their intercourse with each other, or with an adverse judge.

In the coroner's court it is the common practice that he alone asks the medical witness any questions bearing on the case, but, by his permission, any member of the jury or any other interested person may put questions, which should be answered with fairness and candour. With this exception the practice in all courts is the same, and a witness may undergo the following examinations :—

1. Examination-in-chief.
2. Cross-examination.
3. Re-examination.
4. Questions by the president of the court or by a juryman.

Whether he actually goes through them all depends to a great extent on the nature of the case and of his evidence, *i.e.*, whether contested or not.

Examination-in-chief.—The ordinary course of proceeding in a criminal case is thus concisely stated by Stephen, J. ("Criminal Law of

England," pp. 168, 282):—After opening the case the counsel for the Crown calls the witnesses, and examines them according to the rules of evidence—that is, he brings out by questions *which do not suggest their answers* the facts relevant to the issue to be tried which are within his personal knowledge. Those questions which suggest the answers are called "leading" questions. With one exception it is not the practice to allow these to be put in this part of the examination. The exception, according to Stephen, J., is: "When the judge is satisfied, either by a witness's demeanour or by contradictions between the evidence and the depositions, that he is trying to keep back the truth and favour the prisoner, he may in his discretion allow the counsel for the Crown to ask leading questions and, as the phrase is, to treat the witness as hostile."[1] When the examination-in-chief has been given, the next step is the cross-examination.

Cross-examination.—In this, the second stage, the counsel for the prisoner extracts from the medical witness, by questions *which may suggest the answer in the strongest form*, any facts that may appear to be favourable to his client, and which he believes to be within the witness's knowledge. Leading questions are not only allowable in this part of the examination, but, according to good authority, a counsel for the defence can hardly lead too much. The theory of the law is that the witness is unfavourable to the side that is cross-examining him and has come to bear evidence favourable to the other side, and is therefore hostile. The more he has shown himself, by conduct or conversation, a partisan in the case, the more severely will he be treated. Anything which he may have said in the hearing of others, or published in journals, or even written in private letters (if the contents transpire), in reference to the case or the guilt of the prisoner, is now brought to light, although he may have supposed that what he did say was in perfect confidence. It is at this stage of the case that any exaggerations which may have been most favourably received by the counsel for the prosecution are reduced to their true proportions. Any bias by which the mind of a witness may have been influenced, or any imperfection or confusion of memory as to facts, is here brought out (Stephen, *op. cit.*, p. 177). It is in this part of his examination that the witness will be closely questioned as to his qualifications, the time during which he has been engaged in practice, the accuracy of his judgment, his general professional knowledge, and his special experience in reference to the matter in issue, the number of cases he has seen, etc. Straightforward answers should be given to all these questions. No harm can be done to the witness by the answers unless they are given evasively, since it is not to be supposed that the witness wishes to represent himself differently from what he is. If he does make the attempt, he will assuredly fail. The most striking distinction between the examination-in-chief and cross-examination is in reference to leading questions. It rests upon the assumption that there is a danger that a witness will say whatever is suggested to him by the one side, and conceal everything that is not extorted from him on the other. It need scarcely be observed

[1] A hostile witness may therefore be defined as a witness who from any motive is reasonably assumed to have an object in concealing part of the truth, or in giving actually false evidence. Hence the witnesses on the other side are usually hostile, and sometimes one on your own side is so.

that witnesses whose evidence is of little importance in the case are rarely cross-examined. This, however, is reserved in its most stringent form for those whose knowledge of facts and whose opinions are likely to influence the fate of a prisoner in a criminal trial.

In dealing with a skilled witness whose evidence may be of importance, the questions in cross-examination are usually put by the counsel for the prisoner with great caution, or the answers brought out may be more adverse to his own case than those elicited in the examination-in-chief. The most important caution in cross-examination is the use of the phrase, "I don't know." If a witness has once used it, let him adhere to it rigidly and not be bullied by cross-examination into "It might have been." That a cross-examination may cut both ways, the editor once heard an excellent example at the Old Bailey.

The witness (not a medical one, but the moral is the same) had asserted that a bicyclist was going at 30 miles an hour. The cross-examining counsel seized on the point and thought he would confuse the witness, but it turned out that the witness had taken no end of pains to cultivate his judgment of the pace of vehicles in the road, so that the cross-examination only confirmed the recklessness of the prisoner whom the cross-examiner was trying to defend.

Re-examination.—The cross-examination is usually followed by a re-examination on the part of the counsel for the Crown, or of the counsel by whom the witness has been called. The object of this is to clear up or explain any portion of the evidence which may have been rendered obscure or doubtful by the cross-examination. It is sometimes unnecessary to put a question, and if the witness has given his evidence consistently and fairly no questions may be asked. As a rule the re-examination must be confined to those matters which have arisen out of the cross-examination. Any questions upon new subjects may render a further cross-examination on them necessary. In reference to *facts*, a medical witness must bear in mind that he should not allow his testimony to be influenced by the consequences which may follow from his statement of them, or their probable effect on any case which is under trial. In reference to *opinions*, their possible influence on the fate of a prisoner should inspire caution in forming them; but when once formed they should be honestly and candidly stated without reference to consequences. It will be well to remember, in regard to each stage of the examination, what a great medical authority has said :—"To make a show and appear learned and ingenious in natural knowledge may flatter vanity. To know facts, to separate them from supposition, to arrange and connect them, to make them plain to ordinary capacities, and above all to point out their useful applications, should be the chief object of ambition" (William Hunter).

It has been a question whether a witness should volunteer evidence assuming that the examination-in-chief and cross-examination have not brought out all that he knows of the case. If that which he has to state is some matter of fact within his own knowledge, or an opinion based on facts within his knowledge, he will be allowed, on application to the judge, to make the statement in spite of the efforts of counsel on either side to shut it out.

Questions by the President of the Court or a Juryman.—There are no rules to govern such questions. The president has

obviously absolute discretion in putting any himself, as well as in allowing a juryman to do so; they will naturally, however, be simple questions necessary to clear up any small and doubtful point, though, indeed, very important and far-reaching questions are sometimes so put. In a case of infanticide the editor heard an Old Bailey judge put this question: "Then, doctor, you mean there was no evidence of live birth?" "That is so, sir," came the reply, when the judge immediately stopped the case without calling on the defence at all.

Such is the general method by which oral evidence is obtained, but some details of procedure must be noted.

LICENCE AND DUTIES OF COUNSEL.

Medical men have complained, and on many occasions justly, of the licence of counsel. On this subject it may be well to consider what has been said by one of the highest authorities, Erle, C.J.:— "The law trusts the advocate with a privilege in respect to the liberty of speech which is in practice bounded only by his own sense of duty; and he may have to speak upon subjects concerning the deepest interests of social life and the innermost feelings of the soul. The law also trusts him with a power of insisting upon answers to the most painful questioning, and this power again is in practice only controlled by his own view of the interests of truth" (judgment in *Kennedy* v. *Brown*, 1862). Thus it will be seen that almost unlimited powers of interrogation are entrusted to counsel by the law, and it is a question whether the unrestricted use (which it has been justly remarked means only the frequent abuse) of these enormous powers is necessary or even favourable to the administration of justice. One of the most severe reprimands on this abuse came from the same judge in a case which was before him in 1857, and was to this effect:—A question had been put throwing on the witness an imputation for which there was really no foundation. The judge then said: "The freedom of question allowed to the bar was a public nuisance, and the barrister who made such an imputation ought to be prosecuted. If a question had relation to the truth, he was most anxious it should be put; but to cast haphazard imputations at the suggestion of a person (an attorney) who might have no scruples as to what he did was a degree of mischief that made him wish that a party should be prosecuted. He begged leave to say that in his experience he had seen counsel so abuse their privilege that he had cordially wished a power could be instituted that they might be prosecuted for a misdemeanour." It is the general practice to say that the obnoxious questions are in the instructions, but a barrister can always exercise a power of putting or not putting a question which may be found there. Mellor, J., observed on one occasion that "he did not approve of counsel throwing everything upon the attorney. The counsel who put an improper question ought not to be shielded merely because he had been instructed by an attorney. Counsel should always exercise caution in putting a question." By putting it he clearly adopts it, and frequently to the great damage of his own case. This is at present the only check upon the practice, for judges seldom interfere unless directly appealed to by the witness.

Intimidation is sometimes carried very far. On a trial for murder by poisoning, a respectable country practitioner, who had given his evidence for the Crown in a fair and proper manner, was thus addressed in cross-examination by counsel:—"On your solemn oath, sir, and in the face of the whole profession, will you venture to persist in that statement?" Again, the intimidating modes of address—"Do you mean to swear?" "Will you pledge your professional character?" etc., intermingled with the admonitions "Pray be careful," "Be cautious," etc., may suggest to the witness that his examiner already regards him as perjured, and that, however truly he may state the facts within his knowledge, he will not be believed.

A public writer, in commenting on this subject, says, "But the hardest and most unfair part of the system" (of cross-examination) "is when witnesses have to bear a loud and insulting tone or gesture without remonstrance or retaliation." At the trial of Kelly for the murder of Police-Constable Talbot (*Reg.* v. *Kelly*, Dublin Commis. Court, November, 1871), Tuffnell, a surgeon of repute, and formerly Professor of Surgery, was summoned as a witness for the prosecution. Having deposed to the nature of the wounds, and that the deceased died from the effects of them, he was subjected to the usual ordeal of a cross-examination, but in a somewhat unusual form. Counsel for prisoner having begun by addressing him in a loud and offensive tone, he turned to the Chief Baron, and said, "My lord, I am very excitable, and if this gentleman has a right to roar at me, I consider that I have a right to roar too." The court expressed a hope that it would not be necessary for him to roar, and intimated, after a short trial of vocal strength between the two opponents, that counsel's manner to the witness was not what it ought to be. Counsel disclaimed any intention of being offensive, but claimed the liberty which is usually conceded in cases of importance. Whatever may be the importance of a case to a prisoner, nothing can justify the putting of questions in an insulting tone to a skilled professional witness.

We agree with a writer whose opinion has been already quoted that "every contemptuous and even uncourteous expression, every query leading nowhere, except to the end of confusing the mind or irritating the temper of a witness, ought surely to be reckoned as overpassing the legitimate limits of the counsel's office, and as such be regarded with universal disapprobation." That the administration of justice should be aided by this mode of dealing with medical witnesses is impossible. It may be that criminal cases fall more into the hands of the second class of barristers to whom Stephen, J., alludes—namely, those who disgrace a noble profession. But it is a widely spread opinion in the medical profession that this style of examining educated men, who are perhaps compelled most unwillingly to appear on a subpœna to testify to facts, is certainly not adapted to elicit the truth, but rather to favour the escape of criminals and give impunity to crime.

It may be fairly admitted that a man who puts himself forward as a witness, and attempts to elucidate what he only succeeds in rendering more obscure, should receive no favour at the hands of the bar. Elwell, a member of the legal as well as of the medical profession, observes that "no witness is ever compelled to appear and testify

to what *he does not know*. He may be compelled to attend in court in obedience to a subpœna; but if he attempts to testify upon a subject requiring *opinions* upon which he has no well-settled or well-defined ideas, it is his own fault, and he alone is to blame; for no one but himself can know so well as he, until he has exposed himself, how unfit he is for the occasion" (Medico-legal Treat. on "Malpractice and Med. Evid.," by J. J. Elwell, New York, 1863, p. 302). But let us take the case of a practitioner who, in a country district, has gone through twenty years of practice with honour and credit in his neighbourhood, and who is suddenly called to a case in which a man is found dead from a wound in his throat. Under the Coroners Act he is compelled to make an examination of the body for a coroner's inquest. At a great loss of time, and for no adequate remuneration, he attends the inquest, gives his evidence, and is bound over, *nolens volens*, to appear for the first time as a witness at a criminal trial, and to testify (1) to the throat being cut, and (2) to give his opinion to the court on the cause of death, and whether the wound was inflicted by the deceased on himself or by another person. A medical man who limited himself to the statement of the bare fact that the deceased's throat was cut need not appear at all, for this evidence might be supplied by a constable or policeman; but the law presumes from his profession that the medical man made a proper examination of the wound, with a view to determine, to the best of his ability, whether it was the cause of death, and whether it was or was not self-inflicted. It is difficult to understand how a medical man, although before this occurrence he may never have seen a case of cut throat, could excuse himself from giving answers to these questions, both of which involve purely matters of *opinion*. If he excused himself altogether from giving answers, there would be a failure of justice, and no conviction for such a common form of murder could ever take place. If, on the other hand, he answers these questions to the best of his ability, he may reasonably complain that, while thus compelled to appear as a witness to testify to what he knows, his evidence should by rules of law be made the subject of abuse and ridicule before his neighbours when he expresses his *opinion* from the facts, and that the counsel who examines him possesses an unlimited power of misrepresenting his views. A medical man is certainly not benefited in public opinion by being described as an ignoramus or a blunderer in his profession, whom no one ought to trust. The truth is, in medical evidence, facts and opinions cannot be entirely separated; and if medical practitioners were restricted in their evidence only to those facts which they observed in a case in which no other professional man saw the person living or dead, it is difficult to understand how crime could be detected and punished. These remarks of course do not apply to cases in which the opinions of medical experts can be taken. Here it would be desirable that one who has not had experience on the subject should avoid giving any opinion; he might simply state the facts, and decline for want of experience to give an opinion on the conclusions to which they lead. In pursuing any other course, he will find that the whole weight of the cross-examination will fall upon him.

A key to some of the difficulties which medical witnesses must be

prepared to encounter will be found in the exposition given by Stephen, J., of the tacit rules which regulate the duties of counsel for the prosecution and defence:—"In practice it is universally admitted that the counsel for the prosecution is morally and professionally bound always to keep in sight the ultimate object—namely, the discovery of truth; whereas no such obligation is laid upon the prisoner and those who represent him, because it is too much to expect of human nature that they should discharge it, and it is better not to impose an obligation which is sure to be systematically violated. Both sides, on the other hand, are bound in the strongest way *not to do anything to propagate falsehood.* The counsel for the Crown is bound not to suppress any fact within his knowledge favourable to the prisoner; and, on the other hand, the counsel for the prisoner is bound not to bring to light facts within his knowledge unfavourable to the prisoner, but must not deny them if brought out. The counsel for the Crown may not use arguments to prove the guilt of the prisoner which he does not himself believe to be just, and he is bound to warn the jury of objections which may diminish the weight of his arguments; in short, as far as regards the evidence which he brings forward, his speech should as much as possible resemble the summing up of the judge. He should contend not for the success of his cause at all costs, but for the full recognition by the judge and jury of that side of the truth which makes in favour of it. On the other hand, the counsel for the prisoner may use arguments which he *does not believe to be just.* It is the business of the jury, after hearing the judge, to say whether they are or are not just" (*op. cit.*, pp. 160 and 168). The last remark shows what appears to be a serious defect in the administration of the criminal law. While in a case of misdemeanour a prisoner may be tried by a special jury, in a case of felony, involving an analysis of important questions of medical science in reference to murder or manslaughter, the trial takes place before a common and comparatively ignorant jury. Such a jury is hardly in a position to cope with an ingenious counsel, who has it in his power to misrepresent and distort medical facts and opinions in any manner that he pleases. The chapters on Infanticide will furnish numerous illustrations of the measure which counsel take of the intellectual capacity of common juries. The defences made are frequently such as no counsel would venture to place before a jury of educated men. These "sensational" or "powerful" addresses, as they are termed by the press, full of burning eloquence and impassioned logic, have frequently withdrawn the attention of the jury from the real facts, and have procured verdicts of acquittal contrary to the evidence and all the medical circumstances of the case.

Another observation made by Stephen, J., more nearly concerns the medical witness:—"There are many obligations which affect each side equally. Neither is at liberty to attempt to browbeat, intimidate, or confuse a witness, although they may expose any real confusion which exists in his mind, or test by the strictest cross-examination the accuracy of his statements. Neither is at liberty wilfully to misunderstand a witness, or to *misstate in his address to the jury* the effect of what he said, either by distortion or suppression. The neglect or observation of these and other rules of the same kind practically

establishes a wide distinction, and one which is easily recognised, between those who exercise a noble profession and those who disgrace it" (*op. cit.*, p. 168).

Assuming that the witness is properly prepared for the discharge of his duties, and that the questions put to him are answered fairly and truly, according to his knowledge and experience, without exaggeration or concealment, he has no reason to fear any attempt at intimidation. Barristers, for the most part, know that by this line of conduct they lose more, even with a common jury, than they gain by the attempt to confuse the witness; and as their ultimate object is a favourable verdict, they will generally avoid conduct which must necessarily place this verdict in jeopardy.

The normal barrister, as depicted by Stephen, J., is not at liberty, in his address to the jury, to misrepresent, either by distortion or suppression, the medical facts or opinions given in a case. According to the author's experience, however, misrepresentation is a not unfrequent practice, and one of which medical witnesses have very strong reason to complain. Whether such misstatements are in some cases wilful or not it may be difficult to determine, but their effect on the jury is well known to those who employ them, and they frequently escape the observation of counsel on the other side, and even of the judge, unless he happens to be well versed in medical subjects.

The editor must here state his own experience, which is that he has never met with the slightest incivility or rudeness from counsel, and he believes that honest evidence rarely meets with either the one or the other.

QUOTATIONS FROM BOOKS.

It is a not unfrequent custom with counsel to refer to medical works during the examination of a witness. He is expected to have a fair knowledge of the writings of professional men in reference to the subject of inquiry. The authority is mentioned, the passage is quoted, and the witness may be then asked whether he agrees with the views of the author or whether he differs, and if so, his reasons. In cases connected with medical treatment, the views of the profession are and have been so various, that a barrister would have no great difficulty in finding some book to oppose to the opinions of the witness. Standard works of recent date are so well known to the profession that there are few medical men engaged in practice who are not acquainted with and able to explain the views of the writers and how far they agree or conflict with their own. The witness must be on his guard that the quotation is properly taken with the context, or he may unexpectedly find himself involved in a difficulty. On one occasion the author found that a learned gentleman stopped in his quotation at a comma, and on another occasion a quotation ended at a colon, the remainder of the sentence in each case materially weakening the inference which it was intended to draw with the apparent sanction of the witness. The editor would advise the witness to ask to have the book handed up to him that he may read the passage for himself, if he is not already acquainted with it.

When a quotation from a standard work is opposed to the evidence of a medical witness, he should take care, by reference to the work

itself, to see that the passage is correctly quoted. An instance of the importance of this caution occurred at the Swansea Lent Ass., 1869, when an action was brought against a railway company for compensation for personal injury. Plaintiff was proved to have had pneumonia shortly after the accident, and the counsel for the company wished to show that the pneumonia had not arisen from any physical injury, but from shock; and the author's work on "Medical Jurisprudence" was quoted as referring to a case of pneumonia caused by shock. It was subsequently discovered, on referring to the work, that the case in question was one in which the lung had been wounded by a fractured rib. The cause of the pneumonia was thus sufficiently explained; it was proved to have been a result of physical injury and not of shock. A reference at the time to the work which is quoted is always necessary if any use is to be made of a quotation. Without suggesting that there is intentional misrepresentation to bear out a particular view of the case, a barrister, in dealing with the medical facts, may wholly misunderstand the author's views and statements, and in some instances wrongly assign to the author himself opinions which he has merely quoted from other authorities for comment or illustration. On the other hand, it is not permissible, in giving evidence, for a witness to read from a book (*vide* "Documentary Evidence"), nor to quote from one "as a quotation." If he knows that in a certain work an opinion is expressed, he must learn it up and then say, "*I* say so and so": he must not say, "Dr. or Professor So-and-so says such is the case"; but if the opposing counsel thinks he (the witness) is quoting and objects, it is quite open to the witness to say, "Well, my opinion is the same."

MEDICAL PRIVILEGE OR PROFESSIONAL SECRECY.

Some medical men have claimed a privilege not to answer certain questions which are put to them, on the ground that the matters have come to their knowledge through private and confidential communications with their patients. The law concedes no such special privilege of this nature to members of the medical profession. No man is bound to reply to any question if the answer would tend in any way to incriminate himself, for no man is compellable to be a witness against himself. With this exception, all questions must be answered, provided they are relevant to the case; and their relevancy is a matter for the consideration of the presiding judge. Sometimes a witness makes a frivolous objection—the refusal to answer an ordinary question—bringing only ridicule upon himself. A skilled expert, at an important trial, was asked his age. Instead of answering so simple a question at once, he angrily appealed to the judge to know whether he was bound to give an answer on a matter which, as he said, could have nothing to do with the case. The judge informed him that, unless he had some very strong reasons for concealing it, he had better state it. At a trial for murder by poison, in the course of a cross-examination, counsel for the prisoner asked the medical witness what remedy or antidote he had employed when he was first called to attend the deceased. He appealed to the judge to know whether he was bound to answer such a question as that. *Judge:* "Yes, unless you have reason to believe that your

antidote killed the deceased. In that case yon are not bound to answer it." The question was immediately answered.

As there is no special privilege granted to members of the profession, a witness must remember that there are *no medical secrets*. In the case of the *Duchess of Kingston* this privilege of withholding statements was claimed by a medical witness, but denied. In a case in which a female was indicted for the murder of her infant a surgeon was called to prove certain confessions made to him by the woman during his attendance. He objected on the ground that he was then attending her as a private patient. Park, J., said this was not a sufficient reason to prevent a disclosure for the purposes of justice, and he was ordered to answer the questions (Beck's "Med. Jurisp."). At the meeting of the British Med. Assoc. at Leeds, August, 1869, Bateman said, "There are many cases in which a doctor cannot discharge his duty to a sick person without putting questions the replies to which may criminate the patient, or seriously affect his interest, and these replies the doctor is now called upon to communicate either in a civil or a criminal court." A case was mentioned in which two sisters were servants to an old lady. One of them became pregnant, miscarried, and was attended by a surgeon. The mistress, who knew all about the matter, retained the girl in her service, and left her a legacy at her death. The will was disputed by the heir-at-law on the ground of undue influence, and at the trial, in order to injure the girl's character, the surgeon was called, and asked for what illness he had attended her some years before. Believing that he had a privilege, he refused to answer, but it was decided by Kindersley, V.-C., that he had no privilege, but was bound to tell all he knew, and this decision put him to an expense of 30*l.* for costs. In cases of a criminal kind, the same point has several times arisen; and it has even happened that the reply made by the accused to a doctor's professional question has been the sole evidence on which a conviction could be based. It will be perceived, therefore, that any statements which are made to physicians or surgeons while attending persons in a private capacity, although they are not to be volunteered in evidence, must be given in answer to questions whatever consequences may ensue. Cases of poisoning and wounding, duelling, as well as cases which involve questions of divorce or the legitimacy of offspring, may be materially affected by the answers of a medical man on matters which have been the subject of private communications. The difference between the English and the French practice will be seen by reference to a paper by Hemar, "Ann. d'Hyg.," 1869, vol. 1, p. 187. It would seem that in New York, too, "information derived from a patient which was necessary to enable a medical man to treat him is privileged" (*vide Lancet*, 2, 1899, p. 1108).

Such is the law of England on this important subject, and it undoubtedly conflicts flatly and absolutely with the law of honour amongst medical men (and from a breach of which more than one has severely suffered), viz., that information obtained from patients in the consulting room relative to their ailments must be held to be inviolably secret.

The following case was related to the editor, which he believes to be authentic:—

A married woman whose husband was compelled to be away from her for some time consulted a medical man for certain symptoms. He found she was pregnant,

and had reason to believe that about a month later she aborted. In course of time the husband returned, and later became suspicious of his wife's fidelity. In the action for divorce the medical man was called and was asked for what reason the woman visited him. He appealed to the judge, saying: "What she consulted me about was between me and her, and interested no one else." On this statement the judge ruled that he need not answer the question.

Dr. Dixon Mann ("For. Med.," p. 9) says: "A good citizen obeys the law, although he may have scruples in doing so; therefore a witness should not set his private judgment against authority without very searching self-inquiry; an obstinate conviction must not be mistaken for a sense of duty. In the majority of cases it will probably be compatible with his sense of duty if the witness enters a protest against answering the question and then bows to the requirements of the law."

The editor thinks that the best plan to pursue is as follows:—Discuss the matter freely and openly with the person implicated, and with his counsel if necessary or permitted, point out to them the difficulty you fear may arise, and according to the decision you three arrive at make up your own mind as to whether you shall (1) retire altogether from the case, (2) answer the question, or (3) refuse to do so and run the chance of being committed for contempt. To take this latter course you must be clear in your own mind that you are acting according to the highest dictates of honour and are prepared to abide by the consequences, which are certain to be very inconvenient and may be serious.

The Notification of Infectious Diseases Act is the first actual public assertion that medical secrecy is not recognised by law. By it the medical man is compelled to disclose not only the fact of illness, but its exact nature.

The following case has come under the editor's personal observation; it illustrates the difficulties a medical man may be placed in by his peculiar confidential relations with his patients:—

Some thirty years ago a girl unmarried gave birth to a male child. The doctor succeeded in placing it out, and a sum of 500*l.* was paid with it. Before his death, the doctor told his son, who succeeded him in the practice, the whole circumstances of the case. The foster-mother took to drink, and the illegitimate son proved himself to be a "degenerate," to put it mildly. He found out from his foster-mother that he was not her own son, and also that the doctor knew who his mother was. In his efforts to obtain by threats the name of his mother a free fight arose, and the son took out a summons against the doctor and foster-mother for assault. At the hearing of this summons the magistrate demanded to be informed of the name of the mother, which the doctor, very properly in the editor's opinion, refused to give, but in consequence he lost his case.

In November, 1903, the following circular was sent out to the medical profession in Birmingham:—

"Birmingham City Police,
"Detective Department,
"Corporation Street,
"*Nov.* 19*th*, 1903.

"*Child Murder.*

"Sir,—I beg to inform you that at 9.20 a.m. on November 17th, 1903, the dead body of a newly born female child was found in an opening in Aston Brook Street in this city, wrapped in an *Evening Despatch*,

dated November 16th, 1903, and having a piece of lace (probably torn from underclothing) tied tightly around the neck. The body was warm when found.

"A verdict of 'Wilful murder' has been returned at the inquest, and should you be called upon to professionally attend any woman who appears to have been recently confined under circumstances of this nature, I should be obliged if you would immediately communicate with me by telephone or otherwise.

"I am, sir, your obedient servant,

"(Signed) CHARLES HAUGHTON RAFTER,

"*Chief Constable.*"

On it the *B. M. J.* of November 28th, 1903, makes the following remarks:—

"We draw attention to this circular in order to warn practitioners that the information asked for by the Birmingham Chief of Police could only be given by violating the rule of professional secrecy, which enjoins all medical practitioners to keep silent upon matters which have come to their knowledge in the course of their professional duties. Some despotic Governments have at different times called upon the medical profession to notify all cases of wounded persons coming under their care in order to facilitate the detection of crime, but such claims have always been successfully resisted. We must testify in court to facts which have come under our knowledge if the judge directs us to do so, but we are not bound and should refuse to be informers for the police.

Though the editor in the main agrees with the journal, he cannot help feeling that, while human nature remains what it is, the question of whether the profession will help the police in the way indicated will be answered largely by the nature of the crime that has been committed and the public opinion thereon rather than by abstract professional ethics.

In America there seems to be a strong feeling on the subject, for a Bill has been introduced into the Assembly of the State of New York which provides that "a person duly authorised to practise physic or surgery or a professional or registered nurse shall not be allowed to disclose any information which he acquired in attending a patient in a professional capacity, and which was necessary to enable him to act in that capacity." It is, however, provided that in the examination of medical practitioners or professional or registered nurses as witnesses these may, upon a trial or examination, disclose any information as to the mental or physical condition of a patient who is deceased which was acquired in attending such patient professionally, except confidential communications and such facts as tend to disgrace the memory of the patient (*B. M. J.*, 1, 1904, p. 759).

The editor feels that he cannot leave this subject without a word upon the giving of certificates of illness. Very much here depends upon whether the practitioner is acting as a medical *officer* or as a medical *man only*. In the former case it is commonly a part of his agreement to give such certificates when acting for his employers, and those for whom the certificates are written also know that they will be

written and read, and therefore a medical man is in these cases bound to fill a certificate accurately and precisely, stating the exact nature of the disease. This statement answers the following enquiry and hundreds of similar ones appearing in the medical press from time to time.

An engine driver comes to consult me about an ordinary catarrhal ophthalmia, but in addition to this I find unequal Argyll-Robertson pupils, absence of knee-jerks, and other slight symptoms of tabes, and possibly early G.P.I., tremulous tongue, nervousness, and some excitability, etc. Apart from this he is quite well and able to do his work. Am I justified in reporting him to the railway company to prevent his working, as he himself does not see any reason why he should not do so?

But when acting in his private capacity many cases of difficulty may arise requiring great nicety of judgment. The following came under the editor's observation a year ago:—

A child had interstitial keratitis, and a medical man was requested to give a certificate stating that it could not attend school. These certificates require the nature of the illness to be stated. He refused to put this down, but gave a general certificate saying the child was not fit to attend school. As this was deemed insufficient by the School Board, the mother was summoned. The medical man appeared for her in court, but still refused to state the nature of the illness, but said that it had an affection of the eyes. This bit of pedantry on the part of the School Board cost the ratepayers a considerable sum. The doctor's action was much to be commended.

ADVICE TO MEDICAL WITNESSES.

Notwithstanding the remarks *supra* as to the futility of rules for the delivery of evidence, there are still some points of advice to a medical witness which are well worth bearing in mind, as they may save many awkward positions and prevent the court from administering many rebukes.

1. *Have the subject-matter clear in your own mind.* — On this point Elwell remarks: "However anxious an incompetent witness may be to appear learned, and however hard he may labour to show it, he will ever find it a difficult business to make the court and counsel believe that he is really so. To appear really learned, he must be able to make the subject on which he gives an opinion *clear*, and to give *satisfactory reasons* for this opinion. He must be not only a thinker, but must satisfy others that he is master of the subject. Take almost any one of the important scientific questions upon which a professional witness is called to pass an opinion, and unless he has *looked at the subject before with a purpose to understand it*, comprehending its extent, weight, and relations, he will find it to have suddenly assumed an importance he had not suspected just at the time when the discovery will add to his confusion. It is better to make this discovery in the quiet stillness and security of solitude than under the eye of a judge and the severe scrutiny of counsel. A man, whether learned or not, whether in court or out of court, will talk clearly upon a subject he well understands, whether it is scientific or otherwise; but *unless it is clear in his own mind his account of it will be confused and unsatisfactory*" (*op. cit.*, p. 303). This is undoubtedly the test to which every man should rigorously submit himself before entering the witness-box. The case should be viewed in all possible aspects, and if an opinion has been formed, it should be dealt with

and criticised as if it were that of an adversary. As in controversy, a disputant should put himself as much as possible into the position of his antagonist, and see the question from his point of view. In this kind of self-examination it may be well to remember two points: (1) that there is no opinion so certain as that the human mind, if left to itself, will not raise a difference of opinion upon it; and (2) that a man is never so near an error as when he claims a complete immunity from error.

2. *Give* DIRECT *answers to simple questions, and answer the question asked, and that to both sides without perceptible difference between the manner of replying to your own or the opposing counsel.*—Direct answers are necessary, because it is only by them that the case can be brought clearly before the court and jury in all its details. Medical witnesses sometimes forget this, and fall into answers to questions floating in their own minds, or which they think are likely to be put to them. They are also sometimes disposed to anticipate many questions by one general answer. This simply creates confusion, and the witness will be told by counsel to keep to the question, and that he is coming to the other matters presently.

In a case involving a question of compensation for personal injury as a result of a railway accident, medical witnesses were called on both sides. The reporter of the trial observes in reference to the evidence of one of the medical witnesses for the plaintiff: "In the course of a long cross-examination, this witness appeared to avoid giving 'direct' answers to the questions put to him, and to affect to misunderstand them, to such an extent as to draw from his Lordship the remark, 'Do pray, Dr. ——, be a little more candid.'" From some judges a witness thus acting would have met with a much more severe rebuke. A witness should remember, at all times, that he takes an oath to state the *whole* truth.

Most of the questions put by counsel in cross-examination will admit of an answer, "Yes" or "No." If, from the ingenious or casuistical mode in which the question is framed, the witness should feel that the simple affirmative or negative might mislead the court, then, after giving the answer, he can appeal to the judge to allow him to qualify it, or add to it any matter within *his own knowledge* and which is at the same time relevant to the case. The witness must remember that he takes an oath to state the truth, *the whole truth*, and nothing but the truth. On the other hand, while the counsel for the defence is bound not to introduce falsehood, his object is *not* the discovery or development of truth. Unless the witness is on his guard, he may find that his affirmatives and negatives may be worked into a shape representing the reverse of what he intended when the learned counsel who has cross-examined him addresses the jury.

Some witnesses have a habit of not answering the question which is asked, but one which is not asked. In reference to this practice, which generally arises from a want of proper attention to the question, a judge made the following remarks: "When a witness does not answer a question, but answers something else, it leads persons accustomed to courts of justice to believe that he prefers not to answer the question, but to put a different point upon the counsel." Again, we meet with witnesses who begin to answer before the question is

completed. Some are concise from a dread of saying too much, while the answers of others are given in such a voluble form, in the shape of a small speech or lecture, that there is great difficulty in reducing them to their proper proportions. A witness who is so profuse of information generally supplies abundant matter for a long and troublesome cross-examination.

Answers to questions should be neither ambiguous, undecided, nor evasive. An ambiguous answer necessarily leaves the witness's meaning doubtful, and calls for an explanation. An undecided answer—indicated by the words "I believe," "I think," "It might be," or "My impression is"—is not sufficient for evidence. Did the wound cause death? Was death caused by loss of blood or poison? If, by a proper consideration of all the medical facts, the witness has come to a conclusion on the subject, his answer should be expressed in plain and decided language, either in the affirmative or negative. A man who has formed no conclusion is not in a position to give evidence. No opinion should be given for which the witness is not prepared to assign reasons; and, except by permission of the court, no medical opinion should be expressed on facts or circumstances observed by others. A hesitating witness will be met with the question, "Have you any doubt about it?" or "Was it so or not?" to which a reply in the affirmative or negative must be given. If the witness fairly entertains doubts about the matter at issue, it is his duty to express them at once, and not allow them to be extorted from him piecemeal by a series of questions.

Chemical witnesses have occasionally certified to the discovery of "imperceptible," "unmistakable," or "undoubted" traces of poison in the liver, etc. Such terms naturally convey to the shrewd mind of the examiner that the witness has some lurking doubt or suspicion of mistake in his mind, for that of which we are sure requires no such terms to express our meaning. If poison has been discovered, the statement of the fact is sufficient.

3. *Look out for, and call the attention of counsel to, double or involved* QUESTIONS.—Some counsel adopt the ingenious plan of compressing two or three questions into one. A witness unthinkingly answers the last, or that which most fixes his attention. The same answer may not be strictly applicable to all, but the witness may find, when too late, that it is made so in the defence. In this case he should ask for a severance of the questions and give separate replies.

4. *Don't argue with counsel.*—Argument is not evidence, and the entering into it disturbs the order of the proceedings. Arguments between counsel and witnesses, and even between medical witnesses themselves, are freely allowed in the French courts, but in England such a practice is not recognised. The mode in which questions are put by counsel in cross-examination sometimes tends to the introduction of argument, but the witness should avoid the temptation to enter into it. What he says under such circumstances is not evidence, except in the form of answers to questions, and he is there only for the purpose of stating what is relevant to the case.

There is a difference between evidence and testimony. A medical witness sometimes gives much in the form of testimony which amounts to very little as evidence. When he does not attend to the questions,

he testifies to a variety of subjects which have no bearing on the case, and do not constitute evidence.

It is well to remember in connection with the above points that the president of the court is in his place to see as far as he can not only that the work of the court shall be done with due order and decorum, but that justice shall be done to everybody, including the witnesses as well as the prisoner; hence it is a very useful piece of advice to a medical witness to appeal to the president in all cases of what he may consider unsatisfactory questions. He is the arbiter of what is and what is not fair, of what is and what is not evidence, of what questions the witness must and what he need not answer, and any witness has a right to consider himself safe under such guidance.

5. *Speak audibly and distinctly.*—The jury must be able to hear you, and some of the jurymen may be making notes. A judge generally takes full notes of the medical evidence; he has first to hear, secondly to understand, and thirdly to write down, the replies of the witness.

6. *Give your replies, as far as possible, in simple, not technical, language.*—Some remarks have been elsewhere made in reference to the use of technical terms in drawing up medico-legal reports (*vide supra*, p. 11). If medical men could be made aware of the ridicule which they bring on their evidence, otherwise good, by the use of technical phraseology, they would at once strive to dispense with such language. A witness is perhaps unconsciously led to speak as if he were addressing a medical assembly, instead of plain men like the members of a common jury who are wholly ignorant of the meaning of medical terms, and barristers, who are but imperfectly acquainted with them. Thus a medical man will speak of an "exacerbation" instead of "increase" of symptoms, of the "integuments of the cranium" instead of the "skin of the head," while a common cut is described as an "incision," and a black eye as "a tumefaction of the orbit." On a trial for an assault which took place at assizes some years since, a medical witness informed the court that on examining the prosecutor he found him suffering from "a severe contusion of the integuments under the left orbit, with great extravasation of blood and ecchymosis in the surrounding cellular tissue, which was in a tumefied state. There was also considerable abrasion of the cuticle." *Judge:* "You mean, I suppose, that the man had a bad black eye?" *Witness:* "Yes." *Judge:* "Then why not say so at once?" This most erudite description of the injury was at once resolved by the judge into two plain Saxon words, the meaning of which every one in court could understand. In a case of child-murder, a medical witness, who was asked to state simply the cause of death, said that it was owing to "atelectasis and general engorgement of the pulmonary tissue." This is pedantry; and if such language is employed by a witness with a view of impressing the court with some idea of his learning, it wholly fails of its effect.

This reminder is becoming of daily increasing importance. Since Dr. Taylor's death the whole science of bacteriology, with its concomitants of immunity, etc., have flooded our language with words of Greek and Latin derivation which are difficult of comprehension even by educated men, and to an ordinary juryman might as well be Chinese for all he understands of them. Apart from such extreme examples,

however, the use of such words as "peritoneum," "aorta," "omentum," etc., had better be avoided, and "covering of the gut," "principal bloodvessel coming from the heart," etc., used instead.

7. *Avoid exaggeration.*—This is particularly difficult to avoid in many cases owing to the unfortunate habit medical men have of interlarding reports with adjectives and adverbs which pass unnoticed in medical assemblies, but assume great importance when legal minds have to interpret the ideas intended to be conveyed.

If a part is simply inflamed, it is frequently described as "intensely" inflamed. One witness may speak of patches of ulceration in the intestines; another will describe the same condition as "extensive ulceration." On a trial for murder by poisoning, a witness when asked by the court as to his experience of the effects of the poison on man and animals said that he had seen "some dozens of cases." These "dozens" on cross-examination as to time, place, and circumstances, were reduced to the modest proportion of about six to eight cases. This use of exaggerated language often leads to apparent conflict in medical testimony. It is not creditable to the witness, and throws a doubt upon the whole of his evidence.

In writing a report a very good plan is to write in the rough and then correct it by striking out about 90 per cent. of the qualifying adjectives and adverbs.

8. *Never lose your temper.*—A barrister may occasionally, but very rarely, deliberately try to make a witness lose his temper, knowing full well that in such a condition a witness is sure to let fall a rash or hazardous statement; but quite unintentionally he may tempt a witness to do so when trying to expose what he may consider is an uncertainty in the witness's own mind. In such a case remember to lose your temper is to lose the battle.

The subject of oral evidence cannot be concluded without some reference to the very vexed question of

MEDICAL EXPERTS.

So far as regards the value of expert opinion in the coroner's court, the remarks above are a sufficient exposition of the matter. There is a universal consensus of opinion that only experienced pathologists should do such autopsies, and that they should be adequately remunerated for them. In other criminal and civil cases the matter has a much wider circle of influence, and requires great consideration.

In questions of legitimacy or divorce obstetricians of high standing are consulted on both sides; in questions affecting the sanity of persons those who have acquired a reputation in the treatment or observation of the insane are selected; in the various obscure injuries resulting from railway accidents surgeons of repute, and in questions of life-insurance physicians of high standing, are summoned as experts to give the results of their experience. There are many of these cases which could not possibly be settled without this collateral aid, the questions at issue not being based on matters of fact occurring within the ordinary range of practice, so much as on an enlarged experience of a particular department. There is, however, a strong public feeling

against the admission of the testimony of experts. In 1904 at Clerkenwell Sessions, Judge Edge said: "I have no faith in expert evidence called by the parties. They might be the best of experts, but their statements are usually as wide as the poles asunder. I wish the rule here was the same as in Germany, where no expert evidence is allowed except that provided by the court."

The reasons for such feeling are not far to seek, and they certainly have some foundations in fact.

1. *An expert may be biassed on one side or the other.*—One able writer remarks, "It is impossible to shut out such evidence altogether, but there is nothing which brings more discredit upon the administration of justice. There is one consequence of its admission which is common to all cases in which it occurs: it is, that no difficulty has ever been found in obtaining any amount of evidence of this description on either side of any point at issue." The cause of this evil is that the solicitors on each side are allowed to search the whole profession until they can find one or more persons ready to adopt their respective views; when once in court, provided a man can call himself a "doctor," his qualifications and experience sometimes escape a rigid scrutiny. Persons have thrust themselves, or have been thrust, into cases as experts without any pretensions to such a title either by their professional standing or experience. A man who may have been engaged for a few years only in the ordinary routine of medical practice, and who may have had no special experience in the subject on which an opinion is required, will be described by his counsel as "a most learned and eminent member of the profession, on whose opinion the jury are as much entitled to rely as on that of the 'highly respectable gentleman' called on the other side," etc.

Cockburn, C.J., in commenting upon evidence so obtained, observed "that it was in the nature of things that those who gave scientific evidence should lean slightly to the side upon which they were giving their testimony, not from any dishonest intention, but from a perfectly natural and human failing, as in such cases a man was apt to look with a keener eye on those things favourable to his own side than on those which were unfavourable."

Bovill, C.J., in making some remarks on medical evidence, said: "The great misfortune or defect in medical testimony hitherto has been that medical men, like many other professional men, have been too much in the habit of making themselves partisans in endeavouring to support the particular views of the parties on whose behalf they have been called, and this has led to conflicts of opinion which have sometimes appeared not very creditable to the profession." Lord Hatherley thus expressed his views on the subject: "A witness to facts knows that it would be base beyond measure to bend his evidence so as to suit the case of him on whose behalf he is called, and that his only duty is to state plainly without colour or fencing what he knows as a *fact*. But the witness who gives an *opinion* is selected by the litigant after communicating with many of the same profession as the witness, and when so selected he is expected to express a particular opinion."

Closely connected with the subject of bias in an actual witness, there is another objectionable practice, or rather, one should say,

another practice which is certainly liable to lead to objectionable results, viz.:—

2. *An expert may act as medical counsel.*—Some barristers, who feel themselves unable to discuss the medical bearings of a question, are in the habit of employing medical men to instruct them on the best mode of endeavouring to cross-examine medical witnesses, so as, if possible, to place the case in another light before a jury. Such expert advisers do not always go into the witness-box, and therefore cannot have their own means of knowledge or sources of experience fairly tested, while the *selected* medical facts or opinions which they may communicate to the advocate may have the effect of confusing the minds of the jury. Under these circumstances, the result must depend on the acumen and medical knowledge possessed by the judge who tries the case.

The question has been frequently asked, May not a medical witness honestly take up the defence of a prisoner? Is it always certain that the case for the prosecution is indisputably correct? The latter question admits of a simple answer, which will show the course that may be fairly pursued. The evidence for a prosecution may involve a serious medical error, as well as the evidence for a defence. Assuming, from his knowledge of the ascertained facts of the case, a witness believes *bonâ fide* that the medical opinions for the prosecution are incorrect or contrary to his own experience, he has a right to interfere and point out what he considers to be an error of fact or opinion. What he has to state, however, in this behalf should be publicly stated on oath, so that his experience, motives, and honesty of purpose may be fairly and openly tested by a cross-examination. He should remember that his interposition is only justifiable in the interests of justice as well as of the *public*, and not simply in the personal interest of the accused. If he is retained and paid by the prisoner's legal advisers to defend the prisoner's interest, wholly irrespective of the public interests, he is simply a medical counsel or advocate. It is this kind of interference, on the part of some medical and scientific witnesses, which has laid the whole profession under a general censure. When, as in certain criminal trials, men thus hire themselves for the purpose of a defence, *i.e.*, to rescue an accused person from the penalty due to a crime which there may be strong reason to believe he has committed, they may justly be called, in the language of a great lawyer, traffickers in evidence. In one important case (*Reg.* v. *Tawell*, Aylesbury Ass., 1845), a woman died from the effects of prussic acid, and a fatal quantity of that poison, amounting to one grain, was clearly discovered in the stomach of deceased by an experienced chemist. As, from the moral and circumstantial evidence, the guilt of the man could scarcely be disputed, an attempt was made to destroy the effect of the chemical evidence, and to impose on the common sense of the jury, by the statement that the deceased had eaten some apples, that the pips of apples contained the principles for producing prussic acid in the human stomach, and that the poison found in this case had resulted wholly or in part from the apple pips. This monstrous chemical proposition met with no acceptance from the jury; they preferred the doctrines of common sense to this pseudo-scientific theory. The interference in this case for the defence could not have been based on any *bonâ fide*

belief that the chemical evidence for the prosecution, on which the conviction of the prisoner chiefly turned, was untrustworthy.

Medical counsel and medical witnesses are differently placed in relation to a case under investigation. While he who acts solely as medical counsel may have undue weight given to his suggestions in their being put boldly forward by the barrister on his side, in forcible and impressive language, as ascertained medical truths, he entirely escapes that searching examination into his competency which is infallibly the lot of a medical witness; and again, while the latter is bound by his oath, without reference to the prosecution or defence, to state the *whole* truth, the former is only obliged to give so much of the truth as may suit the case of the party for whom he appears. In short, like a barrister, he may be not an advocate of any abstract principle of justice, but of the cause of his client. How far a medical man has a moral right to make use of his professional knowledge in order to embarrass the testimony of those of his professional brethren who are compelled by law to appear and give evidence to the best of their ability is an ethical question which it is here unnecessary to consider; but there can be no doubt that, while in some instances the practice may work well by preventing convictions from taking place upon erroneous opinions, it is liable to be perverted to the worst purposes. An unscrupulous man, who chose to make himself thoroughly acquainted with scientific subjects, might in this way so pervert the medical facts of a case, and lead to the confusion of witnesses who are not able to cope with him, as to procure an acquittal in face of the most convincing proofs of guilt.

It has been stated that no man acting as medical counsel or adviser should on any occasion be allowed to act in the capacity of a witness. Undoubtedly a man who takes up a case with a view of dressing up the facts for one side only, and collecting evidence for defeating by mystification the case on the other side, is not in a position to act as a witness with any credit to himself, to his profession, or to those who summon him. His object is neither truth nor an approach to it, but rather the gaining of a victory *per fas aut nefas*. There is no law by which such persons can be prevented from acting as witnesses; but, as a rule, their evidence is either rejected or received with great distrust. In some cases the cross-examination of such persons would be a benefit, since it might have the effect of showing that many of the questions which they had suggested in the case were based upon erroneous views, on ignorance of the facts, or on actual want of experience. A medical witness may, however, without any imputation upon his *bona fides*, explain medical points to counsel, and correct him on medical subjects when wrong in his views or statements.

3. *An expert has little or no opportunity offered him of altering his opinion when fresh evidence is produced.*—An expert may honestly entertain a certain opinion when first selected, but then it is like the case of a counsel's opinion: the counsel gives his opinion on the statement of facts submitted to him, but perhaps after hearing the other side he would find the case wholly altered, and would say so. The scientific witness called into court by the plaintiff is generally expected to support his case in cross-examination, when many views may be suggested that may really modify the witness's judgment; but even

after facts have been proved that ought to modify it the witness frequently holds to his original opinion. Every witness should eschew altogether the notion of partisanship. He should be ready to give his opinion frankly and unreservedly, regardless how it may tell. He is there not as an advocate, but in order to inform the court and jury to the best of his judgment.

In cases in which medical men summoned as witnesses lend themselves as advocates to the party consulting them for the purpose of weakening or overthrowing the scientific evidence on the other side, in spite of its consistency and accordance with sound medical doctrines, they lose sight of their true position, and justly expose themselves to severe censure. If, on hearing the evidence to facts on the side of the party consulting them, they find the complexion of the case altered, and that they cannot support it as they believed they were in a position to do, it is their duty to themselves and their profession as well as to the public interests—which are always superior to private interests—to withdraw from the case. No man should ever appear to support that which he does not believe to be true.

4. *The present system discourages honesty.*—There can be no doubt that the present system discourages some eminent and upright men, who could by their special knowledge solve many important questions, from appearing as witnesses. Several have uniformly refused on this ground to attend as experts in a court of law. A distinguished chemist, a gentleman of strict honour and integrity, was once asked by counsel in the first question put to him in cross-examination, "When and by whom were *you* first *retained* in this case?" Without directly imputing bribery and perjury to the witness, the innuendo to the court and jury was to the effect that this gentleman had received his fee to maintain a client's cause wholly irrespective of the oath which he had taken. As counsel on both sides look on the experts opposed to them in the light of hired advocates, it is obvious that, so long as this system lasts, it must have a deterring effect on the higher and better class of witnesses, who, whenever they have the option, will avoid placing themselves in such a position as to have imputations of venality and untruthfulness thrown out against them in a public court.

Baly, Munro, Wood, and the author were required to give their opinions in a case of alleged lunacy. They insisted upon being allowed to make a full examination of the alleged lunatic, and the result was that their opinions were completely adverse to those who consulted them, much to their disappointment. They declined to give evidence in the case.

5. *The present system leads to conflicting medical evidence.*—The conflict of opinion among medical witnesses and medical experts is a favourite theme of comment with a portion of the public. The reader will find some remarks on this subject in reference to Commissions of Lunacy. There is little to add to them, for similar remarks apply to all medico-legal cases which come before a court of law. That men should be found who can traffic in evidence is certainly a misfortune for the profession to which they belong, but differences of opinion on the same state of facts may fairly exist in the medical as well as in any other profession. If such differences come more before the public on medical or scientific

questions, it arises from the fact that the cases demanding such evidence are far more numerous than those which affect the two other learned professions. In suits which involve the rights and duties of the clergy, there is seldom agreement among those who have to decide upon them as ecclesiastical authorities. So among members of the legal profession, and in the administration of justice generally, while barristers notoriously differ and give conflicting written opinions upon the same state of facts, special jurors, consisting of highly educated men, are unable to agree in opinion, and are often discharged without a verdict, to the great injury of litigants. If in an important patent case, after a series of appeals, judges themselves differ *toto cœlo* in the construction of the law, and are obliged to read conflicting written judgments *seriatim*, it may be surely permitted to scientific men also to differ conscientiously from each other without any imputation of interested motives. The fact that the venal evidence of "hired" experts or witnesses occasionally finds its way into a case does not justify the sweeping denunciation of medical or scientific witnesses as a body. As Stephen, J., remarks of the law, so it may be said of medicine, no system of rules can fully embody that line of conduct by the observance of which those who exercise a noble profession with honour and credit are distinguished from those who disgrace it. It is purely a matter of sentiment and good feeling; and it is truly a sad day for science, as one judge remarked, when the conflict of opinion may be traced to the ignoble motives of a desire of gain or of notoriety, or of anything but a desire for truth. From these remarks a medical witness will learn not only what he ought to do, but what he ought not to do, in taking up the defence of a person who is charged with crime.

In civil cases it is not always easy to say, until the evidence has been heard in court, whether scientific opinions should be in favour of plaintiff or defendant; and herein lies the great advantage arising from the opinions of scientific experts employed as assessors. There may be on each side a portion of truth which will meet with its medical supporters without any imputation upon their motives, any more than upon the motives of the members of a special jury, who, in spite of perfect absence of bias, cannot always agree. Nevertheless there are some plain matters of fact in which it is discreditable to the profession to find disagreement. If medical science is of any value for the guidance of a country, it should be able to determine whether a man is or is not labouring under paralysis as the result of accidental injury. In the following case (*Sherwin* v. *N.-E. Ry. Co.*, Leeds Lent Ass., 1872) an equal number of medical witnesses supported opposite views. In this case the plaintiff claimed damages for personal injuries. He was described as a strong healthy man up to the time of the accident. The negligence was admitted, and the plaintiff was examined by three medical gentlemen on each side. The three witnesses for the plaintiff stated that he had paralysis of the legs, which was extending upwards, and was of a permanent character, so that he would not be able to walk again. The three medical gentlemen called on the part of the defendants deposed that the plaintiff was not suffering from paralysis at all. The jury found a verdict for the plaintiff.

Although our modern knowledge of the nervous system and our means of investigating its morbid conditions and their symptoms

would probably enable an expert of to-day to give a decided answer to such a case as the above, the editor feels that it is well to leave it in the present edition, as it forms an excellent illustration of the difficulties which still exist in estimating the exact prognosis of a given accident. (*Vide* the Section on "Insurance," for further illustrations and remarks.)

6. *Experts are apt to overstep their proper duties.*—Men of acknowledged skill and good professional experience sometimes quite forget their proper duties as experts, and lay themselves open to censure. An expert is usually called to give an opinion on certain facts laid before the court in the evidence of other witnesses; thus certain appearances may be described as having been seen in the stomach or brain, and he may be asked to state the conclusions to which such appearances lead. A medical practitioner may describe accurately what he sees, but may not have sufficient experience to draw a correct conclusion. In this case an expert may differ from him and totally alter the bearing of the case. So a man may describe certain symptoms which an expert may say are or are not consistent with poisoning, but he must take care that he does not alter or distort the facts deposed to by other witneses in order to fit into the case his own theories or opinions. The alteration of facts to suit special views is by no means unfrequent, and an expert who thus deliberately mangles the evidence of others cannot escape the charge of being a partisan or an advocate in the case—a character wholly inconsistent with that of a witness, who should aim to be in all things impartial. A glaring instance of this kind occurred (Guildford Sum. Ass., 1862) in an action against a railway company for damages for personal injury. The condition of the plaintiff was accurately described by his medical attendant. Some eminent surgeons who had examined him were called as experts to depose to his present and probable future condition. Other equally eminent surgeons were called as experts on the part of the company, and they differed, as well they might, on the speculative question when the man was likely to recover entirely from the effects of the accident. One of the most distinguished surgical experts for the defence, however, began by saying that plaintiff had only sustained a "considerable shake"; but shakes are not commonly recognised as surgical accidents, and the surgeon on the other side had described this "shake," from actual examination, as a "concussion of the spine." But the witness continued—"And as to what was said of congestion of the fibrous tissue, it was mere phraseology not indicating actual facts." The judge who tried the case observed that he could hardly take that as evidence. "*The witness must state facts, or his opinion from facts.*" The witness then *disputed the facts*, but the judge told him that he had no right to do so, and that he must *give his opinion on the facts as proved.* In these few words are defined the whole of the duties of an expert who presents himself as a witness. The above example shows clearly what ought to be avoided, and it corroborates an observation elsewhere made that the greatest professional knowledge and skill may co-exist with an entire ignorance of the proper methods of employing this knowledge to aid the administration of the law.

7. *The present system may lead to undesirable practices.*—Actions

for compensation in railway accidents have brought to light some practices among certain members of the profession which have repeatedly called forth the censure of the Bench. These persons have allowed themselves to be retained by the company as surgeons to attend on those who have suffered injury; they have then been employed to suggest terms for compensation, so as to avoid litigation, and, if possible, to keep the case out of court. So far no public injury may possibly accrue, although the financial part of the transaction is in the province of an attorney, and not of a surgeon; but when the case comes to trial, the matter assumes an entirely different aspect. The medical attendant of the company, who has seen the injured plaintiff, but in the interest of the company, and can probably give the best evidence of the injuries which he has sustained, is so situated, that anything which he may say will necessarily have the taint of bias and self-interest. Medical men have thus been strongly condemned by judges for degrading their profession by lending themselves as money agents for the defendants. A case of this kind (*Lee* v. *Yorks. Ry. Co.*) led to some severe but just remarks on this medical trafficking in accidents in the court of Malins, V.-C. (*Med. Times and Gaz.*, 1870, 2, p. 733).

Other practices, too, of a more remarkable nature have come to light. In a reported trial of this kind, which took place during the Summer Assizes of 1865, there was a conflict of medical evidence respecting the condition of the plaintiff, the witnesses on one side taking the view that he had sustained serious injury, and those on the other that he was either shamming or greatly exaggerating his symptoms. One medical witness, who adopted the shamming theory, and who appeared on the part of the company, had attended the plaintiff and prescribed for him, as an experiment, syrup and water, under which, it was stated, he improved. This satisfied him that the man was shamming. It appeared, however, in cross-examination, that, although the witness was paid for his services by the company, he knew that the plaintiff believed at this time that he was acting as his own medical attendant. This mode of getting up scientific evidence for the company was justly and severely condemned by the judge who tried the case. A medical man's own judgment should suffice to prevent him from falling into errors like these; he thereby not only damages himself, but the profession of which he is a member. Men who adopt these practices should know that they are not in a position to give unbiassed evidence, and therefore should decline to appear as witnesses.

8. *Unfairness may be attributed to experts in trials for malapraxis.* —On such occasions, while there should be no suppression of the truth, a witness is bound, in answering questions put to him by counsel, to state his opinion, and the grounds on which it is based, clearly and distinctly. It may be hard to condemn a brother-practitioner, but it would be still harder to ignore the public interest, and condemn ourselves and our profession by concealing that which we know to be true, or by suppressing what we honestly believe. There is no etiquette in the profession which demands such a sacrifice of principle as this conduct involves. A medical witness is not bound to be forward in pointing out and suggesting defects, or in endeavouring

to lower another practitioner in the opinion of the public; but nothing should be concealed which is relevant to the elucidation of the case in issue. The golden rule, "Do unto others as you would that they should do unto you," should be strictly observed on these occasions.

When such glaring and in many cases serious defects in, and objections to, the system by which medical evidence is at present obtained, are given, it is but right that attention should be called to the possible remedies, some of which are at present, in some cases, within the power of the president of a court or of the parties to a suit to apply, but others would require a definite alteration in the law.

1. Criminal Cases.—It is a fact worthy of note that in criminal trials, where life is concerned, no provision is made by the English law for enabling a judge to take the opinions of one or more medical or scientific experts not connected with the case, although such a practice would be attended with great public benefit. If there is conflicting medical evidence he can only direct an acquittal. Such a result is little less than a scandal to our criminal law procedures. The case of *Reg.* v. *Westworth* ("Abortion"), in connection with instrumental abortion, is an excellent case in point. Whether the verdict was right or wrong, there can be no doubt but that the conflicting medical evidence was not satisfactory. It is but fair, however, to give the opinion of a judge on this matter [though it must be confessed that honest men will rather agree with Dr. Taylor's criticism on the same.—Ed.].

Stephen, J. ("Criminal Law," p. 209), objects to the proposition of referring scientific questions to experts, even when nominated by the court, and he considers a common jury better qualified than experts to deal with and decide on all points of scientific evidence. One of the reasons which he assigns for his objection will probably surprise the medical reader; it is, that experts so nominated and employed, *i.e.*, as assessors to the judge and in the absence of a jury, would *only direct their minds to the truth.* "A juror," he observes, "is not a scientific inquirer, but a judge bound by oath to say whether or not certain evidence satisfies his mind; a scientific inquirer is not bound by anything of the kind." He considers the suggestion (of leaving the questions to an independent board) to be based on a misapprehension of the result to be reached and the mode of reaching it: "It assumes that the object of the inquiry is the attainment of the truth simply, and that scientific men are more likely to attain it than others. To this it may be replied that the result to be reached is not truth simply, but such an approach to truth as the average run of men are capable of making, and that the result is more likely to be found in the opinions of common than scientific jurors" (*loc. cit.*). On this it may be observed that, while experts have the same power of dealing with common things as common jurors, they have an additional special power of making that approach to truth on scientific subjects which common jurors certainly do not possess. It would also appear from this reasoning that in a judicial inquiry affecting a person charged with murder something less than truth is more satisfactory for the purposes of justice than truth itself. Dr. Taylor doubted whether any *opinion* on oath should ever be given. The jury would then see that it

was opinion only; the witness would with more decorum modify his opinion, and would acquire the habit of believing himself to be, not a partisan, but an expert, thus rendering assistance of greater value.

In all cases we think that the light which science can throw upon the question should come not from a witness who is paid to refract it, and who, if his judgment or his conscience will not allow him to make it tell for his client, is not called, but from a man who has no bias, who is chosen either by both parties or by the court, and who is rather an assessor than a witness.

2. Civil Cases.—Here much more latitude is allowed than in criminal cases, and if only judges and parties availed themselves to the full of their powers, but little would be heard in public of conflicting medical evidence.

The practice of the Admiralty Court is an excellent example. Four Masters of the Trinity House, experienced in all the rules of navigation, give their opinions on questions submitted to them, as nautical experts, by the court; and without creating any charge of injustice in the decisions of the court, they constantly guide these decisions by answering certain difficult nautical questions. In a case in which two ships come into collision, both parties contend they are right, or the case would not be litigated. The question turns upon the respective positions of the ships, the setting of certain sails, the direction of winds, tide, and currents, and whether the helm should have been ported or starboarded before the collision. These nautical experts acquit themselves with satisfaction; they are not put into the witness-box by the parties to the suit, but are placed on the Bench, and act with judicial responsibility.

In the Lunacy Commission the visits are made throughout the kingdom by barristers and physicians associated in pairs, the one educated to the investigation of law and facts, the other to the diagnosis of diseases. This has worked admirably. In lunacy cases the presence of one or more of the physicians of the Lunacy Commission, sitting with the judge, and aiding the jury in their examination, would be of more value than the evidence of a hundred ordinary medical men, or even interested experts.

In reference to actions for railway accidents the law has interposed. By an Act passed in 1868 (31 & 32 Vict. c. 119, s. 26) it is enacted that, "whenever any person injured by an accident on a railway claims compensation on account of the injury, any judge of the court in which proceedings to recover such compensation are taken, or any person who, by the consent of the parties or otherwise, has power to fix the amount of compensation, may order that the person injured be examined by some duly qualified medical practitioner named in the order, not being a witness on either side, and may make such order with respect to the costs of such examination as he may think fit." This power was exercised by Kelly, C.B., in a railway case (Exch., December, 1871). Three physicians were examined and gave their opinions on the degree of injury sustained. An eminent surgeon, who had not been consulted in the case, was required under the judge's order to draw up a special report from the facts proved in evidence. This report was given in evidence, and confirmed the statements of the witnesses for the plaintiff; a verdict was given accordingly. Such a principle should be

extended to all cases involving criminal charges and requiring medical or scientific evidence for their elucidation.

The Arbitration Act (55 & 56 Vict. c. 8) is a valuable addition to the statute book. Under it, the parties to a suit can, by mutual agreement, select each an arbitrator, these two arbitrators then agree upon an umpire, and these three together form a court with power to call witnesses and hear evidence. The particular advantage of such a court lies in the fact that the three presidents, all being experts, can allow the witnesses to be as technical as they wish. In doing so they are only talking a language which is as familiar to the court as to themselves, and the court can judge between the witnesses with a tolerable certainty of arriving at a just verdict.

In December, 1899, the editor acted as arbitrator (Professor A. Pepper for the other side and Dr. Mitchell Bruce as umpire) in the case of *Shaw* v. *The Railway Passengers' Assur. Co.* The facts of the case were as follows: On September 15th, 1898, the deceased, a butcher, a stout man, æt. forty-five, was thrown out of his cart. The medical man called in noticed in a few days ecchymosis in left loin, also hæmaturia. He lived for ten weeks after the accident, but never recovered further than to come downstairs. He was seen by other medical men in consultation for obstruction of the bowels caused by some soft mass which could be felt per rectum. On post-mortem examination the plaintiff's medical man gave evidence of the injury, and (what was the chief matter in dispute) asserted that he had removed from the peritoneal cavity in the pelvis a large quantity of "blood clot." In cross-examination he seemed doubtful whether this clot was in or outside the peritoneum. Some of this "clot" was preserved and sent to the Clin. Res. Labor., and was there reported to be a soft sarcoma. On this report the company refused to pay the insurance money, on the ground that they were not liable "where the proximate cause of death is disease, even if the disease be aggravated by such accident or have been due to weakness or exhaustion consequent thereon, or the death accelerated thereby." It was particularly unfortunate for the company that neither the original lump nor any sections of it could be produced. The court were unanimously of opinion that a verdict must be given for the plaintiff.

This seems to be an ideal way of disposing of civil cases in which medical evidence is the chief, if not the only, evidence upon which the verdict must rest.

The Workmen's Compensation Act, 1897, contains some further indications of the best way in which medical evidence should be disposed of.

II. DOCUMENTARY EVIDENCE.

Documentary evidence in courts of law consists of—

1. *Letters, Affidavits, Plans, etc., etc.*, with which the medical witness has absolutely nothing to do. They are matters of pure law, and need no comment here.

2. *Notes and Depositions*, about which sufficient has been said *supra*.

3. *Dying Declarations.*—These are the deliberate statements of a person who is actually dying (*moribundus*, not *moriturus*), and about them a medical witness must know everything, inasmuch as it is almost always a medical man who is responsible for obtaining one where possible; this is certainly the case in accidents which prove rapidly fatal, and in those which prove fatal at some more distant period. It is a medical man's duty to see that notice is given to some legal authorities that proper attention (presence of witnesses, etc.) may be given to the subject, and it is also his duty to note the mental condition,

as well as bodily, of such patients at the time when dying declarations are made.

With regard to the admission of dying declarations as evidence, there are certain points of law which are fixed and invariable; there are others upon which decisions of a somewhat variable nature have been made from time to time.

The fixed and invariable rules are—

1. That they cannot be used in civil cases, but only in criminal ones.

2. That they can only be used in trials (for homicide) in which the death of the person who made them is the actual subject of inquiry.

3. That they can only be accepted as evidence as to the actual circumstances of the death, and for nothing else.

4. That the death of the person making a dying declaration must have actually ensued.

5. That a dying declaration may be made orally or in writing, but, if the former, it must be written down by the person receiving it, either at once or with as little delay as possible, and also, if possible, read over to the dying person and signed by him, or his assent and agreement in some way obtained.

The points open for discussion and decision, of both of which they have received a good deal, are—

1. That the person making them must be actually dying (*moribundus*, not *moriturus*).

2. That he must *believe* that he is so.

3. That he must have no hope of recovery, and *believe* it to be impossible.

The fundamental conceptions underlying these points are (*a*) that nothing and nobody can be accepted as evidence in criminal cases unless there is an opportunity offered for cross-examination; it is obvious that no cross-examination can take place on a dying declaration, it must if admitted as evidence at all, be admitted as it was made, and hence the law regards a dying declaration with a very jealous and scrutinising eye as claiming exemption from this highly prized and invaluable privilege of cross-examination. (*b*) The law assumes that no person would willingly quit this world with a lie on his lips; that, under the sense of impending dissolution, all interest in this world is taken away; and that the near contemplation of death has the same powerful effect upon the mind as the solemn obligation of an oath. A dying declaration, if accepted, must be therefore assumed to prove conclusively the honest belief at the time of the person making it; the belief must be accepted, but it is open to counsel to argue that this belief was wrongly founded.

Such being the case, it is comparatively easy to lay down the law as to what is the duty of a medical man when called to the side of a patient who may have been criminally assaulted, and who he thinks is going to die soon.

Duty of a Medical Man with regard to Dying Declarations.

1. It is his duty to inform such a patient, as kindly as possible, that he is dying, and to put the simple question, Do you wish to make

any statement? Telling the relatives is not sufficient. If the victim declines, the medical man may then urge upon him the importance and advisability of making a statement, pointing out to him what use may be made of it in defending the innocent or in punishing the guilty. Such urging is certainly not the imperative duty which the simple question is. Circumstances must largely influence the action of any one who is thus present with a dying man, circumstances about which it is impossible to lay down any rules; every one must use his own judgment. If the reply be positive, or if the victim, without being asked, volunteers any statement, the medical man must then

2. Notice very carefully the mental condition of the victim. It is well known that when death takes place from violence, especially when loss of blood or a blow on the head is leading to death, delirium is apt to supervene, or the intellect of the dying person to become confused: if then the medical man notices any wandering or want of clearness in the mind of the victim, he must bear it in mind and mention it in connection with his evidence, but this does not absolve him from the next duty though it should make him particularly careful in making his notes. It is also necessary to elicit from the person wishing to make the statement what his opinion of his condition is—whether he himself actually believes that he is dying, or has some expectation of recovery.

3. It is his duty to write down the statement immediately, or on the very earliest opportunity, in the identical words used by the victim, carefully avoiding his own interpretation of them or any paraphrases. It is obvious that the longer the interval between hearing the words and writing them down the more likely is he to err in respect of their exactitude; if he finds it impossible to follow the speaker he must be the more careful to understand the meaning and remember it. If possible, he must get the declaration signed by the victim and by witnesses to its correctness.

4. He must on no account put leading questions, and if by any means possible, he must write down his own questions as well as the answers he receives. Generally speaking, questions should only be directed to explaining what may appear ambiguous or contradictory in the statement of the dying person.

5. It is in general an injudicious proceeding to take a suspected person before one who is dying, in order that he may be identified. At this time there may be a half-delirious state of mind, not easily recognised by non-professional persons; and confessions or statements then made, should, when they implicate other persons and are not strongly corroborated by circumstances, be regarded with great suspicion. A fatal mistake of this kind was made many years since in London. A woman was maltreated by some men on Kennington Common. She was taken to St. Thomas's Hospital, and while dying from the effects of the violence a suspected person was brought before her, as one of the supposed assailants. She stated that he was one of those who had assaulted her. The man was tried, upon her declaration respecting his identity—found guilty and executed; but a year after the execution his innocence was satisfactorily established by the discovery of the real murderers.

6. In cases of longer standing, *i.e.*, where a person who has been criminally assaulted has, as the result of the assault, been ill for some

time and is now dying, it is the medical attendant's duty to inform the officers of the law, warn them that the patient is dying, and allow them to take the steps necessary to have any statement the victim may wish to make, taken down, signed, and witnessed in due legal form.

7. It is not his duty to form a judgment on the admissibility or otherwise of a given declaration, provided he has noticed the mental condition as above; he must give it, if he has a statement of the victim at all, just as it was made and leave the court to decide upon its admissibility.

The following cases illustrate the above rules and suggestions very well. It will be seen that the rules are really founded on the decisions and not *vice versâ*, a result obviously to be expected, since with the law must rest the final decision of what is and what is not to be accepted as evidence.

In *Reg.* v. *Bayley* (Exch. Chamber, January, 1857), in which it appeared that the surgeon had given some hope to the dying person before the declaration was made, while the declarant stated that he did not himself *believe* that he could recover ultimately, its reception was objected to on the part of the prisoners because the surgeon had given the man some hope. He died two days afterwards.

Pollock, C.B., ruled that the real belief of the dying man was the question, and here he had said, notwithstanding the opinion of the surgeon, he believed he could not recover.

In the case of *Reg.* v. *Harvey* (Exeter Sum. Ass., 1854) the chief evidence against the prisoner consisted of certain statements made by the deceased. They were admitted by Wightman, J., because it appeared clearly from the evidence that, when they were made, deceased had expressed an opinion that she should die *shortly*, and had not changed that opinion. Her whole conduct intimated that she had no hope (or belief) of recovery. It was observed on this occasion that the medical and other witnesses were more desirous of telling the deceased her state, than of ascertaining what her own opinion was. In other cases (*Reg.* v. *Wanstall*, Leeds Aut. Ass., 1869, and *Reg.* v. *Pettingill*, C. C. C., April, 1872), Cleasby, B., held that before a declaration could be admitted as evidence, even when taken down by a magistrate, there must be clear proof that the person making it was in momentary expectation of death, or that death was imminent. In *Reg.* v. *Londesborough* (York Lent Ass., 1871), Brett, J., declined to receive a statement because the evidence went no further than this—the dying youth said he thought he should not get better; and in *Reg.* v. *Barrett* (Leeds Lent Ass., 1869), Cleasby, B., rejected a statement in which the expression used by the deceased was—she thought she should not recover. This was also the opinion of the surgeon at the time the statement was made, but this did not prove that she believed her death to be impending. In the case of *Jenkins* (Crown Cases Reserved, April, 1896), a statement was rejected because the dying woman, in using the expression "I have no hope of my recovery," requested that the words "at present" should be added. She died twenty-five hours after making the declaration.

Erle, C.J., in Seaton's case (*Reg.* v. *Pym*, Hants Lent Ass., 1846), said, "The law admits these declarations, not because recovery is impossible, but because there is in the mind of the person making them the conviction of approaching death." Even if he recovers after making it, and lives some hours or days, the statement will be admissible provided it was made under the sense or impression of almost immediate death. It is the proof of the sense of impending dissolution which determines its admissibility.

In *Reg.* v. *Qualter* (Stafford Lent Ass., 1854), the escape of a criminal was attributed to the neglect of the medical attendants in reference to a dying

declaration. The deceased was grossly ill-treated, as it was alleged, by the prisoner and others. He lingered from June 19th until August 8th, 1853, when he died from the injuries received. On his death-bed he made certain statements implicating the prisoner, and upon these the case for the prosecution chiefly rested. Qualter was tried for the murder. The deceased told his wife that he knew he should not recover, but this was *after* he had made the statement against Qualter, and it was therefore inadmissible. A similar declaration affecting the prisoner was subsequently made by the deceased to the surgeon; and it seems that the surgeon had told the wife that her husband would not recover, but not in the presence or hearing of the deceased; hence the declaration made by deceased to him was inadmissible, and the prisoner was acquitted.

There was a want of proof, in fact, that the statement to either had been made by the dying man while he was under the conviction of approaching death. Had the surgeon informed the deceased that he could not recover, or had he made the announcement to the wife in her husband's presence and hearing, the declaration might have been made under circumstances to render it admissible. It is advisable, in all cases when a medical man perceives that the recovery of a wounded person is impossible, that he should take the first opportunity of stating his opinion to the wounded person in the presence of others, so that the ends of justice may not be defeated by reason of the non-observance of these legal forms.

The following important case is taken from "Tidy's Legal Medicine," p. 63:—"In the case of *R.* v. *Morgan* (Cox C. C., vol. 9, p. 337), a question arose as to the admissibility of dying declarations by the subject of the homicide where the wound was serious but no actual fear of immediate death expressed by the person. In this case (a trial for murder) the death was caused by the prisoner cutting the throat of his victim. The deceased about five minutes before his death and when actually dying made the declaration in writing, having at the time no power to speak. This was proved by a witness who saw the deceased come staggering out of the hut with his throat cut. It was held by Denman, J., after consulting Cockburn, C.J., that the declaration might be admissible; but that, having reference to certain decisions, and especially *R.* v. *Cleary* (2 F. & F. 850), it would be proper, if admitted, to grant a case for the C. for C.C.R. The learned judge required that the whole of the evidence should be before him previous to deciding whether the declaration could be received."

[Cases cited in note to this case:—*R.* v. *Reason and Tranter*, 1 Strange Rep. 449; *R.* v. *John*, 1 E. Pleas of Crown, 357; *R.* v. *Tinkler*, 1 E. P. C. 354; *R.* v. *Woodcock*, 1 L. C. C. 500; *R.* v. *Mead*, 2 B. & C. 605.]

In the following case taken from the *Lancet* for January 25th, 1896, there is a somewhat new principle admitted which it is obviously out of the province of a medical jurist to discuss:—"At the Wiltshire Assizes, held last week, Emily Lazenby, Mary Stretch, and Edwin Scriven were charged with the wilful murder of Martha Scriven at Swindon. There was a second charge against Lazenby of feloniously using a certain instrument, and Stretch and Scriven were charged with aiding and procuring Lazenby to commit the felony. The magistrate's clerk gave evidence as to the taking of the dying depositions of the woman. She stated that she made the declaration in the fear of

death and of immediate death. Some considerable controversy took place between counsel as to the admissibility of this declaration, on the ground put forward by the defence that the woman did not believe that she was immediately dying. The medical attendant deposed to telling the woman repeatedly that she was dying. There was one clause in the declaration, 'I might get better; I mean to have a good try.' It was contended that this proved that the woman was not in hopeless expectation of immediate death, and Mr. Commissioner Bosanquet, Q.C., decided to disallow the document as a dying declaration as against all three prisoners, but admitted it as evidence against the two women, because they were present at the time it was read over to her, and he declined to grant a case for the higher courts on this point. A verdict of 'Manslaughter' was returned, and the woman Lazenby was sentenced to seven years' penal servitude and the other two prisoners to five years' penal servitude each."

PRESENCE IN COURT.

In England medical and scientific witnesses, except under special circumstances, are allowed to be present in court and hear the whole of the evidence in the case. This is in some instances absolutely necessary if the court requires medical opinions, for unless the witnesses are fully acquainted with the facts they can give no opinions, and they can only become fully acquainted with the facts by being allowed to be present and hearing the evidence in court. If excluded, the judge or counsel will be compelled to read to the witness notes of the evidence before an opinion can be given, and it may then appear that some small point which counsel did not think of importance is omitted; this if known to the witness might, however, materially affect his opinion. A failure of justice is likely to occur when medical witnesses are excluded, and it is generally where there is no defence or a false defence that the right of excluding them is exercised. The rule in Scotland is different; medical witnesses are there rigorously excluded from court during the delivery of other expert evidence. It is, of course, easy to imagine circumstances under which it might be advisable that a medical witness to *facts* should not be in court during the evidence for the other side, but the editor has had no experience of such a case.

FEES.

There is a very well-known statement that the labourer is worthy of his hire. This may, perhaps, cut both ways; but when consideration is given to the arduous and responsible duties of a medical man in the ordinary exercise of his profession, duties which frequently involve the question of life or death to a patient according to the promptness and skill with which they are executed, and considering, too, the enormous importance of the medical evidence in all cases where it is required, the fees allowed by law are certainly most inadequate

and inequitable, it is well, however, that the medical witness should understand the rules there are on the point.

1. **In the Coroner's Court.**—Every registered medical practitioner is entitled, if formally summoned, to a fee of 1*l.* 1*s.* for attending to give evidence at a coroner's inquest where no post-mortem examination is ordered, and to an additional fee of 1*l.* 1*s.*—2*l.* 2*s.* in all—when an examination is ordered. The fee for a post-mortem examination will not be paid if the examination has not been ordered in writing. These fees are to be paid by the coroner immediately after the close of the inquest. There is no provision for a second attendance at an adjourned inquest, nor for making a second post-mortem examination.

But where an inquest is held on the body of a person who has died in a lunatic asylum, hospital, or infirmary, supported by endowments or by voluntary subscriptions, the medical officer of such institution is not entitled to fee or remuneration.

Under the usual custom of summoning the nearest medical practitioner to attend at an inquest and to make a post-mortem examination, it is just possible that in ordinary cases the fee of one or two guineas may be within the bounds of strict sufficiency, but it does not err on the side of liberality even under these circumstances; but when the jury are dissatisfied (*vide supra*) and it becomes a question of a special pathologist and a skilled analysis, for which there is no provision in the shape of an increased fee, the scale is simply ridiculous and ought to be altered. It must be admitted that the London County Council (and possibly others) acknowledge the inadequacy of the fee, so it may be hoped that provision for special fees will be made in any amendment of the Coroners Act.

The greatest uncertainty with regard to fees seems to exist in the minds of medical officers attached to the cottage hospitals which are springing up all over the country, but there can be no doubt that in the case of such gentlemen no fees can be claimed; workhouse infirmaries are supposed to be included, but exceptions at any rate occur (*B. M. J.*, 2, 1902, p. 920).

2. **In the Magistrate's Court.**—If the witness resides within three miles of the court half a guinea a day is allowed, if at a greater distance than three miles one guinea. A most iniquitous and, we believe, illegal practice has grown up at some police courts of giving no fees unless the case is committed for trial to a higher court (*vide B. M. J.*, 2, 1902, p. 200, where this point and its natural results are discussed). If the medical witness be summoned to give evidence on more than one case in the same day he is legally entitled to demand his fee for each case.

3. **Assize Court.**—At assizes, medical men attending to give professional evidence are allowed 1*l.* 1*s.* a day, 2*s.* for every night they are away from home, and second-class travelling expenses by rail, or a sum not exceeding 3*d.* a mile each way when there is no railway. Sundays are never counted as days. To show the unjustness of these allowances, it is only necessary to ask if any of our legislators know of an hotel where he can get supper, bed and breakfast, for two shillings. The necessity, too, of a *locum tenens* is quite ignored.

On December 28th, 1903, the following scale was adopted by the Secretary of State. The regulations may well be inserted in full.

"Whereas divers rules and regulations have been made under section 5 of the Criminal Justice Administration Act, 1851, as to the costs and compensation to be allowed out of county or borough funds to prosecutors, witnesses, and others in criminal prosecutions, and as to the form of the certificate to be granted by the examining magistrate or magistrates in respect of such allowances; and whereas it appears to me, the Right Honourable Aretas Akers-Douglas, one of his Majesty's Principal Secretaries of State, desirable and expedient that other regulations should be made in substitution therefor: now I, acting in pursuance of the powers vested in me by the enactment herein-before mentioned, do hereby revoke all such rules and regulations respecting any of the aforesaid matters, and make the following regulations in lieu thereof.

"1. **Witnesses giving Professional Evidence.**—There may be allowed to practising members of the legal and medical professions, for attending to give professional evidence, but not otherwise, allowances not exceeding the sums stated in the following scale:—

For attending to give evidence in the town or place where the witness resides or practises—

if the witness attends to give evidence in one case only, not more than one guinea per diem;

if the witness gives evidence on the same day in two or more separate and distinct cases, not more than two guineas;

For attending to give evidence elsewhere than in any town or place where the witness resides or practises, whether in one or more cases, not more than two guineas per diem.

"In this regulation 'town' means municipal borough or urban district; and 'place' means the area within a radius of three miles from the court at which the witness attends to give evidence.

"No allowance may be given under this regulation to the solicitor for the prosecution, except that, if such solicitor gives professional evidence which, in the opinion of the proper officer of the court, was necessary and saved the attendance of another witness, a fee of 6*s.* 8*d.* may be allowed.

"2. **Expert Witnesses and Interpreters.** — There may be allowed (*a*) to expert witnesses such allowances for attending to give expert evidence as the court may consider reasonable including, where necessary, an allowance for qualifying to give evidence, and (*b*) to persons employed as interpreters, such allowances as the court may consider reasonable."

"7. **General Regulation.**—No full day allowance under regulation 1 shall be paid unless the witness is necessarily detained away from his home, or place of business or employment, for at least four hours for the purpose of giving evidence.

"If the time during which the witness is necessarily detained away from his home, or place of business or employment, be less than four hours, he shall receive not more than one-half of the allowance which he would have received had he been detained for the full day.

"8. **Travelling Allowances.**—There may be allowed to witnesses attending court to give evidence from a distance of more than two

miles their railway fares actually paid, or (where a railway is not available) reasonable expenses of conveyance actually incurred: provided—

(1) That the railway fare, except for special reasons allowed by the court, shall be third-class fare; and that if return tickets are available, only return rates shall be allowed. In the case of police witnesses the reduced rates under the Cheap Trains Act, 1883, shall not be exceeded, except for special reasons allowed by the court:

(2) That the expenses of conveyance, otherwise than by railway, shall not in any case (except where a special conveyance is required for a witness suffering from serious illness) exceed 1*s.* a mile one way. Such expenses shall be allowed separately as mileage."

There seems to be no allowance for hotel expenses in the new rules, which perpetuate most of the worst features of the old ones.

Those who are interested in the working of the rules will find many letters in the *Lancet* and *B. M. J.* for the first half of 1904—*e.g.*, *B. M. J.*, 1, 1904, p. 808; *vide* also *B. M. J.*, 2, 1903, p. 142, for the evidence, and *Lancet*, 2, 1903, pp. 171, 182.

4. **Higher Civil Courts.**—In the Supreme Court of Judicature, and in the Court of Appeal, 1*l.* 1*s.* a day, if resident in the city where the case is tried; and 2*l.* 2*s.* to 3*l.* 3*s.* a day, if resident at a distance from the place of trial, inclusive of all except travelling expenses. For travelling expenses a sum not exceeding 3*d.* per mile each way if there be a railway, and 6*d.* per mile each way if there be no railway. It is customary to pay return first-class, or sometimes second-class, railway fare only. In the Divorce Court, 1*l.* 1*s.* a day, if resident within five miles of the General Post Office. Higher charges are allowed for experts, but not exceeding 5*l.* 5*s.* a day, including all except travelling expenses. Sundays are never counted.

Such are the facts, and the medical witness must know and remember—

(*a*) In criminal cases (including the Coroner's Court) when once he has accepted a subpœna *he has absolutely no option at any time subsequently*, but must attend and give evidence under the above scale of fees.

(*b*) In civil cases, even after accepting a subpœna *but before being sworn* (for attending to the subpœna, *vide supra*, "Subpœna") let him insist upon having in writing an agreement about his fees, both as to their amount and as to who is to be responsible for their payment, before he consents to give his evidence; after taking the oath he is subject to the rules of the court, and must give his evidence irrespective of his chance of getting a fee, or of its size. Therefore he should take care that in all cases where attendance is required in a civil court to give expert evidence, a special agreement be made in writing, binding the solicitor who requires the attendance to himself pay the fees, as these are only recoverable from principals, unless there is a special agreement to the contrary. A solicitor who serves a subpœna is not liable for the fees. In a case in which an action was brought against a solicitor for the amount of the fees, Bramwell, B., said: "As a rule, an attorney was merely the agent of another person, and if he simply

subpœnaed a man, he was not liable, the witness's action for expenses being against the principal." This shows the necessity for a special agreement.

(*c*) That an *unregistered* medical practitioner, whatever his diplomas may be, is in exactly the same position as an unqualified quack, so far as recovering fees by legal process is concerned; he may accept what is offered him, but can only recover on an agreement *made beforehand* in the same way as any private individual.

SECTION II.

MEDICO-LEGAL RESPONSIBILITY IN THE EXAMINATION OF THE PERSON, ALIVE AND DEAD.

(*a*) Examination of the Living.

THROUGHOUT this work cases are constantly occurring where it is necessary for the ends of justice that a living person should be examined professionally, and it is well therefore that this subject should be considered in a general sense apart from the particular circumstances which render an examination advisable.

In rape, divorce, pregnancy, wounds, lunacy, and in fact in nearly every section of this work, the matter constantly occurs.

The first principles of the matter are so important, and possibly so little known, that they must be clearly stated once for all as a foundation for subsequent remarks.

These principles are as follows :—

1. That in the case of an unconvicted prisoner, or of a person merely suspected of being implicated in a charge, in other words, in the case of any one in the world[1] under ordinary circumstances, it is absolutely *ultra vires* for a policeman, coroner, coroner's officer, lawyer, magistrate, judge, or even a bench of judges, in fact for any one, to make an order for the personal examination of any one.[2] Such an examination can only be made with consent; if without consent it is an assault.

2. Consent should and must be obtained from—

(*a*) The medical practitioner himself, *i.e.*, let him ask himself the question, "Have I strong grounds for believing that an examination is really necessary for clearing up points which are vital to the case?" "Are my grounds such that I could make them convincing to a jury if I were charged with assault?" in other words, let him have the support of his own conscience that he is acting honourably and justly.

(*b*) From the person who is to be examined, if of such an age and understanding as to be capable of giving consent.

(*c*) From the parents or guardians, or nearest available relatives of the person to be examined, if such person is not of an age nor understanding to be able to give personally a valid consent.

[1] It is possible that this statement may not apply to convicted felons, but in their case difficulties of the nature we are considering are not likely to occur.

[2] The right of search of the *clothing* of prisoners is apparently on a different footing; a nice point might arise if a person were suspected of concealing stolen property in any of the natural passages of the body, but such can hardly occur to a medical man; but if he were called to such a case I would still advise him to get either consent from the victim or a guarantee in writing from the authorities at whose suggestion he is acting.

3. Such consent should be given in writing (preferably), or in the presence of disinterested witnesses in any case, and if the case is in the slightest degree doubtful from any cause whatever, the medical man must insist upon its being given in writing and upon a guarantee being given against any proceedings.

4. Such consent must not be obtained by fraud nor by any undue moral pressure or duress; it must be freely given after a full explanation of the circumstances for which it is asked and of the consequences that may result from it.

It is possible that the editor, working as a lay (non-legal) authority, has put the matter a little too strongly, or rather a little too absolutely, but as this work is intended for the general body of medical practitioners more than specialists and high judicial authorities, no harm can be done by any one, into whose hands it may fall, acting on the safe side and adhering to the above principles. Moreover, the editor feels that his position is very nearly if not quite justified by actual legal *dicta* from the highest authorities.

It is, for instance, a very firmly established principle of English law that no one is bound to give evidence against himself, and, since the result of an examination may be adverse, he might thus by consenting to an examination be giving evidence against himself.

The following is from the Police Orders issued to the Metropolitan Police as to the "*Medical Examination of Prisoners*":—"The law officers of the Crown having advised the Secretary of State that it is expedient that a medical examination of prisoners charged with such offences as rape should be made, police inspectors must see that such examination is made in such cases where a prisoner consents. With regard to the offences to which this order is applicable it is impossible to give a complete list, but it includes unnatural offences and rape, and all offences under the Criminal Law Amendment Act, 1885, and all cases in which the examination under this order, without the prisoner's affirmative consent, seems likely to furnish evidence as to the prisoner's guilt or innocence. If a prisoner consents to such examination, he is to be told that if he desires the attendance of a qualified medical man on his behalf, an opportunity for such attendance with the divisional surgeon will be given, and arrangements are to be made accordingly. An entry is to be made and signed by the inspector at the time of every proposal for a medical examination, and of the fact of consent or refusal being given by the prisoner in his presence, also of the offer made to the accused to allow a qualified medical man to attend on his behalf, and of the fact of the accused having accepted or rejected such offer, and such entry should be read to the accused person. If an examination is made, and a committal for trial takes place, the officer must attend the trial and have the entry with him to prove the consent. The divisional surgeon must make a separate entry in his private memorandum book of the result of any examination, and he must be informed of the time and place where his attendance will be required to give evidence before the magistrate. By an examination carefully conducted under these rules, an innocent man cannot suffer, and such examination would often furnish cogent evidence against the guilty. This order does not interfere with the accustomed police or other search of prisoners charged with felony,

with a view to discover evidence bearing on the charge, under paragraph 36 of Police Order 'Prisoners,' which is not applicable to a medical examination; nor does this order interfere with the accustomed practice as to medical aid. Where a prisoner is in custody on any charge in which a personal medical examination may be material to the accused, but not being an offence to which paragraph 2 of this order extends, if the accused or their friends (acting with their consent) expressly desire such examination, it is to be made either by the divisional surgeon or by any qualified surgeon or medical man attending on the part of the accused, in which latter case the divisional surgeon is also to be present, and the officer in charge of the station is expressly to enter in the Occurrence Book the request of the accused and the compliance with it and to report the facts."

On these rules Dr. Stevenson commented as follows:—

"All these minute directions show how jealously the person of a prisoner is safeguarded, and these instructions, so far as they apply to London divisional surgeons, apply with equal force to every surgeon who is asked to examine a male prisoner. This consent is all the more important because many men, especially young men, finding themselves in custody, might submit to an examination under terror, which is not consent.

"It is not only necessary to obtain the consent of any prisoner to an examination, but it is very desirable to caution him that the examination may be evidence in his favour or against him, and that in either case the surgeon will be bound to tell the truth. In a case of unnatural offence tried by Hawkins, J., at the C. C. C. in 1890, a divisional surgeon of police was severely censured by the judge for not cautioning the prisoner as to the result of the examination, and so taking advantage of the prisoner's ignorance.

"Men who commit these crimes frequently are well aware of the importance of an examination as *primâ facie* evidence in their favour, should it be negative, and it is surprising how often a criminal assault has been committed without leaving any trace upon the accused.

"But refusal to submit to an examination is not necessarily an admission of guilt. For instance, a prisoner may be suffering from venereal disease, and be unwilling that this should be disclosed, and yet may be innocent of the crime of which he is charged. If the complainant has venereal disease too, this coincidence might be false as well as true evidence.

"There is not unanimity of opinion among the English judges as to the necessity of obtaining consent before examining a prisoner, and at a trial in 1890 for murder following rape, Huddleston, B., laid down that the police had as good a right to examine the prisoner's person as his clothes. But most judges are of a diverse opinion, and under such circumstances medical practitioners would act wisely in being on the safe side."

In previous editions of this work the following remarks with cases occur. When a domestic servant is suspected of being pregnant the mistress generally sends for her medical attendant to make an examination so as to confirm or rebut the suspicion. Medical practitioners being summoned for such a purpose should be careful to explain to the mistress that such examination can only take place with the free

consent of the suspected servant, and that compliance does not mean consent. The servant should be kindly and gently told what is her mistress's fear, assured that the examination is suggested in her own interest and to clear up a suspicion which may be ill-founded, and told plainly that it is for her to decide whether she will be examined or not. The following case is a warning to all practitioners who are consulted in such cases :—

Tho plaintiff was a domestic servant in tho employ of two of the defendants. On the return of her mistress from a visit, the latter was told by a charwoman, whom she employed, that the plaintiff was in tho family way. She at once ordered tho plaintiff to pack up and be ready to leave after tho doctor who had been sent for had been and examined her. The defendant examined her and found that she was not pregnant. The evidence as to consent was conflicting, the plaintiff stating on oath that she did not consent, the defendant stating on oath as positively that she did.

Lindley, J., withdrew the case from the jury as to the master and mistress, but left the case as to surgeon to the jury, who found a verdict for the defendant. The case was heard again on appeal, when the two judges, Lopes and Lindley, differed diametrically on this point of consent. The former observed that the plaintiff protested against the examination, and he did not see what more she could have done. Lindley, J., observed that the plaintiff was not a child, being twenty-eight years old, and could easily have prevented the examination if she had wished. The verdict of the jury was upheld. The surgeon examined the plaintiff without any witness, and without her consent having been expressly given, though the evidence on this point was conflicting. The case was carried from court to court, and though the defendants won all through they were subjected to heavy costs as well as much annoyance. Lord Esher (then Lord Brett), one of the Lords of Appeal, condemned strongly the practice of sending for a doctor to examine a servant to see if she was pregnant. He urged that masters and mistresses ought not to regard such a circumstance, even if true, as an insult to themselves, and that their aim should be to get the servant away quietly without any exposure. Some exception must be taken to this rather one-sided view of the case. It may be, and probably is, done with the kindest intention and spirit. If a domestic servant is pregnant the sooner she is made to understand this the better for herself. She ought to be plainly told that it is her duty to make proper preparations for the birth of her child, and she should be warned as to what the serious consequences might be were she taken unawares and her child found dead.

In general, in cases of infanticide, it is the mother of the child who is charged with the murder, and in this case it may be necessary, in order to connect her with the child, to determine whether she has or has not been recently delivered. Medical evidence may show that the date of delivery does or does not correspond with the date of the birth and death of the child. The usual appearances in cases of recent delivery both in the living and dead body, are elsewhere fully described ("Delivery"). These appearances necessarily vary according to the time at which the examination is made. Toulmouche has reported in detail several cases showing the post-mortem appearances met with at different dates. ("Ann. d'Hyg.," 2, 1864, p. 349.) Among other

points, it will be necessary to examine the dimensions of the pelvis of the woman, since this examination may throw some light upon the truth of a defence as to rapid or protracted delivery. Unless an examination of the woman is made within twelve or fifteen days after delivery, no satisfactory evidence can in general be obtained.

If the reputed mother of the child is dead, an order may issue for a post-mortem examination of her body, and the case will present no difficulty; if living, a question may arise as to medical responsibility. In general, a woman consents to be examined, but it may happen that she refuses to submit to a physical examination. An innocent woman is just as likely to refuse permission as one who is guilty; but, if circumstances point to one out of several women in a household, the refusal to permit an examination would of course be interpreted against her. It has happened that medical men have assumed to themselves the right of enforcing an examination of a suspected woman, and, by threats or otherwise, have compelled her to undergo this. Such a course of conduct is improper; and it is only when a woman willingly consents to be examined, that a medical man is justified in making an examination. It would, however, be proper in such a case to give her the warning which every magistrate and coroner is bound to give to any woman charged with murder, before requiring an answer to a question which may be used in evidence against her at the subsequent trial.

The case is different, however, when a medical man takes this authority upon himself, and compels a suspected woman, unwillingly, or under duress, to submit to a physical examination. By taking this illegal course, he is forcibly compelling a woman accused of murder, to produce positive proof of her guilt. The mischievous results of such officiousness on the part of a medical man are well illustrated by the following cases. A surgeon and an inspector of police insisted upon examining two women, a mother and daughter, in order to determine whether either of them had been lately delivered of a child. This was against their consent, and in the absence of the husband and father. He brought an action against them, and recovered damages. (*Lancet*, 1869, 1, p. 752; 1871, 2, p. 333). The other case was that of *Weir and wife* v. *Hodgson* (Liverpool Wint. Ass., 1861). The dead body of a child had been found near the house of the plaintiff. The defendant, a surgeon, went with an inspector of police to see Mrs. Weir; and, having informed her that she was suspected of having had a child, told her that he had come to examine her by the authority of the law, and that she must submit. She refused at first, and proposed to send for a medical man whom she knew. In the end the defendant examined her, and there was no ground for the charge. The jury returned a verdict of 200*l.* damages for the assault. The police can give no legal power to a medical man to make such an examination in a suspected case, and the ultimate consent of the woman, if extorted by threats or intimidations, will be no answer to a charge of indecent assault.

The question here presents itself—Who is empowered to give legal authority to a medical man to examine a woman under such circumstances, if she refuses to undergo it voluntarily? Except on one occasion (*infra*), we are not aware that coroners and magistrates have

claimed and exercised such an authority. According to the best authorities on the office and duties of coroners, no such power as that claimed, viz., that a woman should be compelled to produce evidence against herself, is conferred either by custom or statute. It would be quite exceptional and repuguant to all the principles of British jurisprudence if such a power were conferred.

In reference to the compulsory examination of women charged with child-murder, there is no statute which authorises such a proceeding. Any coroner issuing such an order to a medical man would be acting *ultra vires*, and any medical man obeying it, might render himself liable to damages for an indecent assault.

Dr. Lowndes, of Liverpool, comments thus on the above case :— "The veriest tyro in medical ethics will see that the defendant made several most deplorable mistakes.

"1. In acting upon a supposed authority, which was, to say the very least, doubtful. Every practitioner, and most laymen, know that a coroner has power to order the post-mortem examination of a body, to summon jurors and witnesses, and to give burial orders. But although, by virtue of his office, he is to a certain extent a magistrate, and can commit for trial those against whom juries have returned verdicts of murder or manslaughter, the power to order a respectable married woman to submit herself to a medical examination merely because the body of an infant has been found near her house, did not then, and, as we shall see, does not now belong to him.

"2. In refusing to accede to her very reasonable request to have a medical man with whom she was acquainted present. Had he done this—explained that the examination might remove all suspicion, and obtained her free consent, all would have been well.

"3. In failing to perceive that the coroner and inspector of police had both made a most egregious blunder in asking him to perform such a duty, when he found the suspected woman to be a respectable married woman. For it cannot be expected that any medical practitioner should act mechanically in such a delicate case, or as the mere instrument of the coroner and police. He should at once have gone to the coroner, expressed his doubts, and declined to act until assured that he would be justified in doing so.

"The result of the case was very sad. The plaintiffs were represented by the late Mr. Edward James, Q.C., of the Northern Circuit, who made the most of what was to him a splendid opportunity for the display of forensic eloquence. The defendant was represented by the talented gentleman who, then Mr. Brett, Q.C., has since risen to be the present Lord Esher, Master of the Rolls. But he had a desperate case. The defendant's conduct subsequent to the examination was as ill-judged as his previous action had been, and though the learned judge (the late J. Crompton) warned the jury against being led away by the impassioned eloquence of counsel, the verdict was for the plaintiffs, damages 200*l*. This was practically ruin to the defendant, who soon afterwards left the neighbourhood."

In 1871 a case occurred which placed the question of medical responsibility in cases of alleged infanticide in a painful light. A young lady, the sister of a clergyman, committed suicide rather than submit to a physical examination by two medical men under the order

of a coroner. The coroner held an inquest on the body of a child in a case of alleged infanticide. A suspicion arose that this young lady had been recently delivered. Two medical gentlemen, armed with a written order from the coroner, went to the rectory where she was residing, and requested an interview with her for the purpose of ascertaining whether she had recently had a child. She refused to see them, and subsequently destroyed herself. The attempt to examine this young woman for the purpose of obtaining evidence against her on a charge of child-murder appears to have had such an effect on her mind as to lead to suicide. The fragmentary particulars of this sad case will be found in the *Lancet* for 1871, 2, pp. 333, 474, and 477. The medical men, in endeavouring to justify themselves for the part which they took in the matter, relied upon the written order of a coroner. But no coroner can order the performance of an illegal act, and should he do so, refusal to obey it is clearly justifiable. In the interests of the medical profession, and as a guide in future cases of this kind, the following legal opinion on the subject was procured:—

"After diligent search on the subject of a coroner's authority, I entertain no doubt that an order for the physical examination of a woman, in a case of suspected infanticide and concealment of birth, is grossly illegal. Such a method of obtaining evidence is completely at variance with our principles of justice; and I can find no authority for it anywhere.

"The practice of searching persons in custody is simply a police regulation for purposes of safety, to prevent suicide, and for the discovery of stolen property, and has no analogy to searching a woman's person in order to obtain evidence of concealment of birth.

"The coroner issuing such an order, and the medical man acting under it, would alike be liable to heavy damages in an action; and every surgeon acting under the orders of the police, or any other authority, is bound to see that the order is not in excess of their jurisdiction.

"Whether any, and if so what, change in the law on the present subject is desirable, is a matter not now in debate; but the question, whenever opened, will prove to be a very wide one" (*Lancet*, 1871, 2, p. 477).

No decision on this question may have been hitherto made by the judges, but if they denounce in the severest language the conduct of the police or of medical men in putting questions to and extracting criminatory answers from a woman charged with child-murder, they are not likely to spare a person who obtains from a woman by force and intimidation evidence of her criminality by a compulsory physical examination. Members of the profession should remember that an illegal claim made by a coroner will not exonerate them from the responsibility for an assault. In the above-mentioned case, the medical men appeared to have considered that the coroner had power to issue such an order under the Medical Witnesses Act (6 & 7 Will. IV. c. 89), but this only empowered a coroner to make an order for the examination of a dead body. It refers to the examination of the dead child, and not of a living woman ("Sewell on Coroners," pp. 64 *et seq.*).

The following cases and comments are also from the pen of

Dr. Lowndes, of Liverpool:—"I am indebted to a legal relative for the case of *Agnew* v. *Jobson and others*, quoted in the Law Journal Reports and in the *B. M. J.*, January 7th, 1882, p. 20. The plaintiff was convicted at the Durham Wint. Ass., 1875, for concealing the birth of her bastard child. Subsequently the Vigilance Association for the Defence of the Personal Rights of Women and Children, on behalf of the plaintiff, who was a minor, brought an action against the first defendant, who was a surgeon and a justice of the peace, for having in that capacity ordered the examination of the plaintiff by a physician and a surgeon, who, with a police inspector, were also defendants, to ascertain whether she had been recently delivered. She was examined twice—on the first occasion by the physician only, and, from his evidence and from that of the surgeon who examined her on the second occasion, it appeared that no force was used on either occasion to induce the girl to submit. The first examination was only partial and incomplete, but on the second examination the plaintiff said, 'I have already confessed, and there is no use in your examining me'; and, while not resisting the inspection, she did not expressly consent to it. As no evidence was offered against the inspector of police, the case against him was abandoned. During the progress of the trial Mr. Justice Lopes said:—'Unless the jury are convinced that the girl gave her consent to the examination, the defendant had no right to do it. . . . I think there is a great difference between consenting and submitting. But if she really consented, thinking they had the power to compel her, that would do.' In his charge to the jury, he further remarked that 'the main question was, Had the plaintiff actually consented to the examination which took place on the second occasion? If not, then the examination would be an assault, illegal and unjustifiable, and the plaintiff would be entitled to their verdict. But if she consented, then they must find for the defendants. . . . They were dealing only with the second case; and it was for them to say whether it looked like the girl consenting when she told the doctors that it was no use their examining her, as she confessed all. . . . The order given by the magistrate was a foolish one, and Dr. Jobson must have known little of the law. . . . The defendants had acted extremely foolishly, and the damages might be such as to show, in unequivocal terms, that neither magistrates, nor policemen, nor medical men, may infringe on the rights of any person.' A verdict was accordingly returned for 50*l.* damages for the assault.

"The case of *Latter* v. *Braddell and wife and another*, for which I am also indebted to the same source, is a very instructive one, teaching us what to avoid. The plaintiff was a woman of about twenty-eight years of age, and was housemaid in the service of Captain and Mrs. Braddell, who some time before the occurrence had been absent from home. They returned on the 23rd December, 1879, and on the 27th, in consequence of some information given by a charwoman to Mrs. Braddell, the latter came to the conclusion that the plaintiff was pregnant, and told her to pack up and leave before twelve o'clock, as she was in the family way. This the plaintiff denied. Mrs. Braddell replied, 'The doctor will be here directly'; the doctor (whose name I purposely suppress) had been previously sent for unknown to the plaintiff. Mrs. Braddell told the plaintiff to go to her room, the

plaintiff cried; Mrs. Braddell forbade her to speak. The plaintiff went to her bedroom, and shortly after the doctor came there too. The plaintiff cried, said she had never had such treatment before, asked him what he was going to do to her, and said she did not wish to be examined. There was some conflict of evidence between the plaintiff and the doctor as to whether she consented or not, which might have been avoided had the examination taken place in presence of a third person, as should always be the rule. The doctor examined her, found that there were no indications whatever of pregnancy, and said that he must speak seriously to Mrs. Braddell about it. Notwithstanding which Mrs. Braddell dismissed the plaintiff, and refused to give her a character. She brought an action against her master, mistress, and the doctor. The case was tried at the Spring Assizes, Manchester, before Mr. Justice Denman, and as the jury could not agree, they were discharged. It was re-tried at the following assizes before Mr. Justice Lindley, who withdrew from the jury the case against the master and mistress, as he considered there was no evidence against them of the plaintiff's non-assent on which the jury could reasonably act, and a verdict was therefore found for the doctor. But the case was not allowed to rest here. The Vigilance Association, previously alluded to, assisted the plaintiff in taking the case to a higher court, when the defendants were required to show cause why the verdict should not be set aside, and a new trial had on the grounds that the learned judge ought not to have withdrawn the case against Captain and Mrs. Braddell from the jury, and that the verdict was against the weight of the evidence. It was argued before Justice Lindley, who tried the case at Manchester, and Justice Lopes. Learned judges have made merry about 'who shall decide when doctors disagree,' and 'the conflicting character of scientific evidence on both sides.' We might fairly reply, that while there must be differences on such contradictory subjects as symptoms, yet medical witnesses generally agree upon matters of fact, and yet upon the very facts and the construction to be put upon them, we find these two learned judges diametrically opposed to each other. To Mr. Justice Lindley, who first tried the case, the conduct of the defendants seemed perfectly proper, except that Mrs. Braddell's conduct appeared harsh in dismissing the plaintiff without a character, after it had been proved that the charge made against her was unfounded. He remarked that the plaintiff was not a child, and could very easily have prevented the examination had she wished, and, in his view, the doctor's conduct was kind and considerate. Mr. Justice Lopes expressed himself very much as he did in the last case. He considered the sending for a doctor by a master or mistress, and directing him to examine a female servant without first apprising her, in any circumstances, an arbitrary and high-handed proceeding, and it could not, in his opinion, be justified unless the servant's consent be voluntarily given. The submission, under the idea that she had to obey her mistress, was not consent, and she swore at the trial that she did not consent. He was of opinion that there should be a new trial. The rule being discharged, the case was taken to the Court of Appeal, and argued before Lords Justices Bramwell, Baggallay, and Brett. Justice Lindley's view was upheld, but Lord Justice Brett made the following remarks:—'I cannot conclude this judgment without

expressing my abhorrence of the whole conduct with regard to this unhappy girl from beginning to end. I cannot conceive how right-minded people should presume because they suppose—even if it had been true—that a young girl is in the family way, that they should immediately take it into their heads that they are insulted. Why on earth should they have sent to the doctor? If they did not like to keep the girl, why not let her go away as quietly as possible? This idea of having servant girls examined by doctors is, to my mind, absolutely wrong, and it is conduct which everybody ought to scout.' It was proposed to appeal to the House of Lords, but this idea was given up, and the decision of the Court of Appeal remained unchanged.

"I pass on to the examination of males charged with rape or indecent assaults. In the notorious case of *Boulton and Park*, a London police surgeon received a very stern rebuke from the late Lord Chief Justice Cockburn for having examined one of the accused, while in custody, without having first obtained his consent. The learned judge told the witness that the prisoner would have been perfectly justified in knocking him down!

"Within the last twelve years I have been frequently asked to examine male prisoners charged with rape and indecent assaults. I have not only always made it a rule to obtain their free consent, but I have also added this caution: 'The result of the examination may be in your favour, it may be against you; in either case, I shall be obliged to tell the truth. Do you still consent?' If, after this, the prisoner consents, and without my assistance or that of any one else, proceeds to undress himself, I have no hesitation in examining him. I felt the importance of this in one case where the prisoner had an indurated ulcer on his penis and condylomata, which, as the girl upon whom he had been accused of committing a rape was also suffering from primary ulcers and condylomata, was very important confirmatory evidence.

"A barrister, who is now a colonial judge, informed me a few years ago that my caution was unnecessary, and that a prisoner actually in custody could have his person examined whether he consented or not. Other barristers better acquainted with criminal law have expressed a totally different opinion; and I feel very sure, after what was laid down so clearly by Lord Cockburn and Justice Lopes (now Lord Justice Lopes), that if the question were again raised, any medical evidence against the prisoner obtained without his full consent and knowledge of its importance, would be considered by his counsel as inadmissible, and would almost certainly be ruled as such by the Court."

With these opinions and cases to support him, the editor feels no compunction in leaving his primary statements to appear, as representing, if not the absolute and fixed practice of the law, at any rate a very safe guide for all concerned in such cases.

Peculiar conditions are laid down for the examination of the person under the Workmen's Compensation Act (*vide* "Insurance"); but neither these cases nor any civil action for damages can give rise to any trouble to a practitioner if he acts in accordance with the above suggestions at the head of this Section.

The following case, taken from the *B. M. J.*, December 14th, 1901,

p. 1787, is of interest in this connection, as showing the difficulties medical men may meet with :—

The case reported was an action raised at the Solihull County Court by Mrs. Alice Spicer, of Hay Mill, near Birmingham, against Dr. Frederick Vincent Hall, also of Hay Mill, the action being for damages for an alleged assault. The prosecution was conducted by Mr. Dorsett, instructed by Mr. Philip Baker, and the defence by Mr. Colam, instructed on behalf of the Medical Defence Union by Mr. Hempson.

The allegation of the prosecution was to the effect that Dr. Vincent Hall, in July of last year, knowing that the husband of Mrs. Spicer was away in hospital, called at the house of Mrs. Spicer, and, after some conversation in reference to there being no children by her marriage, forcibly and against her will, made an examination of her, which caused her much distress. This statement by the counsel was supported by Mrs. Spicer in her evidence; but she admitted that she had not told her husband until later, although she alleged that she had told certain women in the district. The plaintiff could not fix the date of the alleged assault, but gave it approximately as being about thirteen months ago.

Dr. Vincent Hall gave evidence that he had called at a certain date upon the woman to inquire after her husband, whom he had sent into hospital, taking much interest in the case. The plaintiff had some conversation with him about her childless condition, and asked if it were possible for her to have children. The defendant stated that he could not tell without making an examination, which the plaintiff desired him to make. He demurred, stating that he could not do this without someone else being present; to which the plaintiff objected strongly. After some further conversation, he consented to make the usual examination at the plaintiff's desire.

Dr. Hall was cross-examined by Mr. Dorsett, and other witnesses were about to be tendered by the defence, when the jury stopped the case, and the judge gave a verdict for the defendant, with costs on the higher scale.

A great deal of interest was shown in the case, and a large number of medical men from Birmingham attended to support their colleague, Dr. Hall, but the collapse of the prosecution prevented their evidence as to his high professional character and reputation being brought forward.

The following case is interesting in this connection, taken from the *Lancet* a year or two ago :—

A sharp difference of opinion occurred at the Lancaster Assizes at a late hour on Friday evening, November 6th, between Mr. Justice Ridley and Mr. Sharp, counsel for a prisoner named Joseph Fleming, charged with a rape on a married woman at Barrow. Dr. W. A. Holmes, of Barrow, who was called for the prosecution, stated in answer to the prisoner's counsel, that he examined the prisoner and his clothing some hours after the alleged offence, but that he found no marks whatever corroborative of the prosecutrix's story (who had stated that she was menstruating when the assault took place). Dr. Holmes added that he expected that a man in the prisoner's position would have removed any marks and have cleaned himself in the interval. Mr. Sharp made no remark as to this addendum by the witness during his examination, but when he commenced his address to the jury he animadverted upon it in a severe way. "No more scandalous remark was ever made by a doctor," he said. "Instead of answering the question put to him in the affirmative or negative, he made an addition he should not have done." Mr. Justice Ridley (sharply): "I do not agree with you, Mr. Sharp, that it was a scandalous remark on the part of the doctor." Mr. Sharp: "And I respectfully beg to disagree with you, my lord. I have heard the medical profession belauded, and rightly so, in this court, because of the way in which members of the profession give their evidence, and I have generally found in my experience that they give their evidence fairly, but in this case I hold to my opinion that it was a scandalous remark for Dr. Holmes to make." Subsequently, when his lordship was summing up the case to the jury, he observed: "Now, I must say a word about the doctor. I disagree with the learned counsel for the defence in the observation he made. I think what the doctor did was not scandalous. He gave his evidence very fairly.

Most members of the medical profession do give their evidence fairly and properly, and I hope it will be made known that I think so, because if such an attack is made upon a gentleman in Dr. Holmes's position, it is well he should be defended from such an uncalled-for attack. I never heard a more uncalled-for attack upon a professional witness. At any rate, if Dr. Holmes is to be attacked by one person in the court, he shall be defended by another." The jury found the prisoner guilty of an indecent assault "under extenuating circumstances," and he was sentenced to four months' imprisonment. Counsel for the defence in a criminal trial sometimes resorts to an attack upon a witness for the prosecution in the endeavour to secure the acquittal of his client by diverting the jury's attention from the true issue. In the case above quoted the learned judge took care, as a judge should do, that the issue should not be so obscured.

And also the following one that occurred at the June Assizes at Chelmsford, for although it was the police that were animadverted upon, it is nevertheless a warning to medical men who might be placed in a similar position:—

Sarah Revell and Mary Ann Revell, mother and daughter, were indicted for the wilful murder of the illegitimate child of the latter prisoner at Epping.

According to P.C. Wilkinson, in consequence of rumours in the village, he interviewed the mother, who first denied and then admitted, that the daughter had had a child. Further questioned, she confessed that it had been tied up in a bag and then thrown into a pond. She said the child was born prematurely. Later he saw the daughter, who made a statement, admitting the birth, and alleged that her mother disposed of the body. The girl is only nineteen years of age.

Mr. Justice Phillimore, in charging the grand jury, had specifically referred to this case and to the methods of the police, remarking that the method of obtaining a confession from one prisoner, and then, armed with this, interviewing the other, reminded him of the methods employed in France and other foreign countries, rather than English methods of criminal justice.

Upon the opening of the case, Mr. Grubbe said that in view of the doubt as to the child's independent existence, the prosecution did not wish to proceed on the charge of murder.

Prisoners pleaded guilty to concealment of birth.

The judge called forward P.C. Wilkinson, and questioned him as to his interview with prisoners. "Would you not expect the younger woman, after what you said, to believe the mother had confessed to murder?" he asked.

Wilkinson: I don't think so, my lord.

The Judge: No doubt you are a very zealous officer, but you must be more careful. It was not fair.

Prisoners were each sentenced to twelve months' imprisonment.

The danger of making examinations of girls without the presence of a witness is well exemplified by the case of W. H. Ray, who, at the Margate Quarter Sessions in January, 1903, was sentenced to six months' hard labour for an unlawful assault: there was no corroboration of the testimony of the girl, who alleged that the examination was done without consent.

As in questions of professional privilege (*supra*), there is a difference between a medical officer and a medical man in making examination of persons, that is, in the degree of moral pressure he can bring to bear, but a medical officer must still remember that consent is necessary.

In the *Ed. Med. Jour.*, 1897, is a very interesting paper by Dr. Nelson Hardy on this subject and other duties of medical officers.

It is hardly necessary to warn medical men against the following simple trick. A man charged with raping a small child, asked to be

examined; no discharge was found in his urethra. The fact was that he was aware that the child had been found to have a discharge, and that he had taken the precaution of micturating a short time before his own examination. The editor inserts the warning, however, because the "obvious" so often eludes observation.

B. Examination of the Dead Body.

1. For the examination of a dead body, or of human remains, no further authority than the written one of a coroner is required, or the consent, in non-judicial cases, of the nearest relative or of a guardian.

2. On the subject of the "possession" of a dead body, and performing a post-mortem examination without consent—a subject upon which the editor has frequently been consulted—it is interesting to observe that no property resides in a dead body, and should a post-mortem be done without consent no offence at law is, *ipso facto*, committed; it is only a moral offence against the relatives, which should of course be avoided. Removal and preservation of organs is likewise no offence. One or two actions are on record of living persons claiming by legal process portions of their anatomy, or pathological products such as stones, which have been removed; judgment has always been entered for the plaintiff.

These two paragraphs do not exhaust the subject, and it is well that a medical man should be informed upon it.

On p. 95, *infra*, is recorded a case in point, but complicated by the fact that the patient had died shortly after the administration of an anæsthetic, and the coroner elected to hold an inquest.

The following case is from the *Lancet*, 1, 1897, p. 605:—

An inquest was recently held at Grays by the deputy coroner, touching the death of an infant aged five months. Deceased had suffered from "discharge from the head during the few days previous to its death." On February 5th the child was left in bed by the mother apparently asleep. The bedclothes were clear of the face. Shortly afterwards it was noticed that something was wrong, and Dr. Snell was sent for, but before his arrival the child was dead. The report of the inquest relates that Dr. Snell stated in his evidence that "he had not the slightest information as to whether the child died a natural death or the reverse; and at the request of the father he made a post-mortem examination and found the cause of death to be asphyxia." When asked the cause of death, Dr. Snell refused to answer on the ground that the coroner had not issued an order for a post-mortem examination, and that he should not divulge the secrets obtained by a necropsy privately paid for by the parents. That an inquest was necessary in this case there can be no doubt. That a necropsy was desirable seems probable, but upon the coroner was cast the duty to determine these points. We have frequently asserted that where the cause of death cannot be determined beyond reasonable doubt from the general and medical evidence, a post-mortem examination should be made. The coroner, acting within his discretion, thought it was not called for and declined to make an order. In the first place Dr. Snell was clearly in the wrong. From his own evidence it is obvious that he could not give a certificate of the cause of death, and hence it follows that the body passed into the possession of the coroner, and to make a necropsy without an order was a mistake. The fourth section of the 5 6 & 7 Will. c. 89, provides that "no fee or remuneration shall be paid to any medical practitioner for the performance of any post-mortem examination which may be instituted without the previous direction of the coroner." It is obvious that Dr. Snell could not legally claim a fee for what he had done without official authority. Could he then be compelled to state the result of his examination? The question is open to argument, but on the whole we are of opinion that, bound by his oath to give in evidence

concerning the death "the truth, the *whole truth*, and nothing but the truth," he could not on the ground of professional secrecy decline to divulge the knowledge he had acquired at the post-mortem examination.

The *Lancet's* comments on the action of Dr. Snell in the above case are clearly correct, but we think that his wrongness consisted chiefly in (1) claiming a fee for the autopsy, and (2) refusing to state what he had found, and not in performing the post-mortem with the sanction, if not at the wish, of the father.

As the case is at bottom, *i.e.*, the cause of death not diagnosed completely during life, a very commonly occurring one, we may lay down in a few paragraphs the line of conduct a medical man should pursue in such cases.

1. If it is obvious that the cause of death is a natural one, and the medical man wishes for a post-mortem solely for his own professional information, he must obtain the permission of a responsible relative or guardian before acting; should another relative object the medical man would act more wisely by at once desisting, but if he still persists he is only acting illegally when he forces access to the body against the authority of the master of the house wherein the body lies; the post-mortem examination itself is not illegal under these circumstances.

2. If the cause of death is doubtfully natural, and the medical man cannot clear up the point without an autopsy, one or two courses are open to him.

(*a*) The most unsatisfactory, but withal one that is often pursued, is to swallow objections and sign a certificate on the simple disease, and omit all mention of any accident or foul play. This plan is bad on all grounds, for, not to mention the dishonesty of it, all sorts of rumours may be spread, and ultimately an inquest may be necessary, at which the action of the medical man may be handled very severely.

(*b*) He may explain fully to a responsible person the need he sees for an autopsy and obtain permission to perform it. He is then fully entitled to perform it, because he is as yet uncertain whether an inquest will be necessary; but if he has made an autopsy under these conditions he must not suppress any facts he has acquired when signing the certificate, and if he finds evidence of unnatural death he is bound to report the matter to the coroner.

(*c*) He may proceed as in (*b*) but be refused permission, and now he has only an option of pursuing the unsatisfactory course (*a*), or reporting the matter to the coroner; in the latter case he must not touch the body till he has obtained a written order from that authority or his deputy.

3. If the cause of death is quite unknown (as in the above case), he certainly is acting legally in performing, with permission, an autopsy, and if he finds that the cause of death was natural he can fill up the certificate to that effect without further delay; but where Dr. Snell above went wrong was in demanding a fee for this from the coroner (he was quite right in accepting one from the father) and refusing at the inquest, which the coroner still elected to hold (with this discretion of the coroner no medical man has any right whatever to interfere, even if he have given a certificate in due form), to state his results.

If, however, in these circumstances (cause of death quite unknown) he is refused a post-mortem, he is bound in honour to refuse a certificate and to report the matter to the coroner.

4. When once circumstances have arisen, whether before or after death, that necessitate a report to the coroner, a medical man must on no account touch the body for the purpose of an autopsy without the *written* authority of the coroner; to do so is to render himself liable to be committed for contempt of court.

The following case, taken from the *B. M. J.*, 2, 1904, p. 624, shows how the law may endeavour to make a post-mortem illegal.

"On August 5th, Mr. John Shaw Carleton, a surgeon practising at Newnham, was summoned at the Littledean Petty Sessions, to answer certain charges under the Anatomy Acts of 1832. According to a report published in the *Gloucester Journal* it was alleged: 1. That he, upon July 25th, 1904, being a person lawfully qualified to practice medicine, unlawfully did practise anatomy without having obtained a licence in pursuance of 2 & 3 Will. IV. c. 75, empowering him to do so. 2. That on the same date, being qualified to practise medicine, he unlawfully did examine anatomically the body of John Price, without the permission or direction of the surviving wife. 3. That he did unlawfully carry on anatomy at a place, to wit, the house of Emily Price, there situate, without having given at least one week s notice thereof before the first receipt or possession of the body for such purpose to his Majesty's Secretary of State for the Home Department.

"The facts of the case appear to be shortly these:—John Price died of heart disease on July 23rd. Prior to his death he was being attended by a Dr. Harris or his assistant, but some years ago he had been attended by Dr. Carleton. On July 23rd, Mr. M. F. Carter, coroner for the Forest Division of Gloucester, received a police report concerning the death of John Price. On July 24th Mr. J. W. Guise, who was acting as the coroner's deputy, received a communication from Dr. Carleton, in reply to which he sent the following letter: 'Dear Carleton, I did not know I was to hold an inquest to-morrow on poor Price. I have had no instruction myself from Mr. Carter to this effect. If, however, he tells you I am to, there is no doubt I shall do so. As to the necropsy, if you cannot arrive at the cause of death without one please make it. It is my practice to leave these matters to the discretion of the doctor. If I am to hold an inquest I shall probably do so between five and six o'clock to-morrow.' On July 25th Dr. Carleton called at the house of the deceased, saw the body, and made a necropsy. There was a dispute as to whether upon this occasion Walter Price, a son of the deceased, did not ask Dr. Carleton whether he had any authority to make the necropsy. Dr. Carleton, in the course of his evidence, said that he acted upon the written authority given by Mr. Guise, and that in his practice, which extended over twenty-six years, he had never held a necropsy without an order. He had not told the relations of his intention for fear it would distress them. He had merely wished to clear up a mystery which existed in connection with the death. Dr. Harris made out a certificate of death from heart disease at 11.30 a.m. on Monday, July 25th.

"At the conclusion of the evidence the magistrates retired, and upon returning said they considered that the summons must be dismissed. They did not think upon the evidence that a jury would convict. Dr. Carleton acted upon the best authority he could get, and the authority was the letter written by Mr. Guise."

It is obvious that the Act was never meant to be applied to this offence, and it is doubtful if a jury would ever convict.

The *B. M. J.*, *ibid.*, p. 611, thus comments on the case :—

"The law with respect to the body of a deceased human being is a little curious ; it is quite clearly the law of this country that a human corpse is a thing which does not and cannot belong to any one ; this being the case, it follows that a man cannot, by will or otherwise, dispose of his dead body ; and even though, by will or otherwise, he is at liberty to direct that his body after death be treated in a certain fashion, yet the fulfilment of those directions cannot be enforced upon the executors of the deceased's estate nor upon his nearest known relatives. At the same time, the legal personal representatives of a dead person have a right to the possession of that person's body and to its custody until it is buried or disposed of in some other lawful manner, such as burning, and in two well-known cases the dead person's representatives recovered possession of his body from creditors who attempted to detain it as security for the settlement of certain claims against the estate of the deceased. There have been not a few curious actions at law with regard to human corpses, and the fact that there could be no property in a corpse made it exceedingly difficult to put a stop to the practice of body-snatching. Since there was no property in a corpse it could not be stolen, and, provided that sacrilege was avoided, and the corpse alone removed, the act of removal was merely a misdemeanour. Prior to the Anatomy Act of 1832 the Colleges of Surgeons and Physicians in England were entitled to receive annually for the purposes of dissection a certain number of the bodies of executed felons, and the bodies of all murderers executed in London and Middlesex. These privileges, however, were abrogated by the Anatomy Act, which is authoritative with respect to all medical aspects of the law relating to dead bodies. A human corpse cannot now be examined for any purpose, or even removed for such a purpose, except upon certain stringent conditions ; while, once buried, it cannot be touched at all except upon the order of the Secretary of State for the Home Department, and under a faculty granted by the ordinary for that purpose. The conditions affecting medical practitioners are as follows : A body may be examined upon a coroner's order made in the exercise of his discretion, or upon an order issued during the course of an inquest by a majority of the jurors present. So, too, any medical man is legally entitled to examine a body provided he obtain the permission of the legal personal representative of the deceased or other person having lawful possession of the body, unless the deceased shall have expressed a desire during his life that the body should not undergo examination, or unless the surviving husband or wife, or any known relative, require the body to be interred without such examination, and such relatives should be apprised of the intended examination, and have a reasonable time for objecting thereto. The relatives, moreover, have a right to object even if the deceased during his life directed that his body should be examined after his death. Due observance of the Act is secured by penal clauses, which makes any failure to observe its provisions a misdemeanour, punishable by fine or imprisonment. No difference is established between the position in the matter of a private practitioner and that of a medical officer of a hospital or other like institution."

SECTION III.

MALPRAXIS.

DEFINITION, OR RATHER THE LACK OF IT.
DEGREE OF SKILL EXPECTED.
LIABILITY FOR SKILFUL NURSING.
CASES UNDER THE NOTIFICATION OF INFECTIOUS DISEASES ACT.
CONTINUING ATTENDANCE.
LOCUM TENENS AND QUALIFIED ASSISTANT.
EXTENSION OF AN OPERATION.
ERRORS IN DIAGNOSIS.
ERRORS IN TREATMENT.
ADMINISTRATION OF ANÆSTHETICS.
QUACKERY.

The question of malpraxis is of course an extremely wide one and cannot be here exhaustively discussed in all its details. It is nevertheless advisable to consider what is the law upon the subject and to illustrate the position by a few examples.

In a paper published by Mr. Stanley B. Atkinson in *St. Bart. Hosp. Jour.*, February, 1902, p. 70, to which the reader is referred, it is stated that "the London Medical Defence Union, with 4,750 members, contested last year 140 cases, and in each case succeeded in exonerating a member from an apparently false charge; of these cases forty-nine related to matters alleged defamatory and twenty-six to charges of malpraxis, *malum regimen*, or negligence. This statistic implies that in one year 3 per cent. of the Union's members had to prove their right before a jury, before whom improper intention or attention had been set up as a defence, usually in mitigation of medical charges," and later reports of the same and similar Societies show that actions of this nature are actually increasing, and would increase even more rapidly if it were not for the establishment by medical men of such means of defence, large numbers of actions being stopped every year by the knowledge that the Society would fight the case to a finish if it was once started.

Negligence has no Act of Parliament constituting it a statutory offence; there is no parliamentary definition of the tort, for it is part of the common law of the land; there is indeed no special law in the matter applying to medical men to the exclusion of his Majesty's other subjects, the general law merely has special and personal applications. It is here desirable to explain the principles underlying the whole subject of legal negligence by illustrative cases rather than by jurisprudential reasons. The best *obiter dictum* on our subject is that of Baron Alderson (1856):

"*Negligence is the omission to do something which a reasonable man,*

guided upon those considerations which ordinarily regulate the conduct of human affairs, would do, or doing something which a prudent and reasonable man would not do."

At the outset it may be stated that the judge's function is to state generally what *may be*, it is for the jury called for the special case to decide what *is* negligence. In a few cases the judge may peremptorily declare, "*res ipsa loquitur.*"

Chief Justice Tindal once directed his jury thus:

"Every person who enters a learned profession undertakes to bring to the exercise of it a reasonable degree of care and skill. He does not undertake, if he is an attorney, that at all events you shall win your case; nor does a surgeon undertake that he will perform a cure, nor does he undertake to use the highest possible degree of skill. There may be persons who have higher education and greater advantages than he has; but he undertakes to bring a fair, reasonable, and competent degree of skill."

By the fact of his State registration a presumption arises that a qualified medical man knows his work and does it properly, and he has no need to adduce evidence of general skill and fitness; he is held *primâ facie* competent in any lawful act, and on the plaintiff lies the onus of proof to the contrary; if he poses as a specialist a greater competence will be presumed, and yet considerable latitude in the practice of any theory or line of treatment will be allowed; this latter statement has the support of a Medical Act. But if a jury decide, after hearkening unto the evidence, that a registered practitioner has been guilty of a culpable lack of attention, an absence of due care and caution or competent degree of skilful knowledge, and on that account has actually caused needless injury and loss to his patient, then the medical man may not only forfeit his fee, but (since 1873) be liable to an action in the King's Bench for damages for the benefit of the patient (or his relatives!). The malpraxis must be a substantial thing, and will carry responsibility with it for its natural and probable consequences.

Errors of negligence may obviously be of two classes—omissions and commissions.

It was held by Lord Ellenborough, that if a person acting in a medical capacity be guilty of misconduct arising either from gross ignorance or criminal inattention, by which a patient dies, he is guilty of manslaughter. Faults, such as omissions, or errors in judgment, to which all are liable, are not of this amount of criminality.

In the case of *Reg.* v. *Dickinson* (Stafford Lent Ass., 1846), a medical practitioner was charged with having caused the death of the deceased in her confinement. This appears to have been a case of placenta prævia: the placenta (after-birth) was removed, but the female sank under the bleeding which followed. Platt, B., after consulting several medical works, charged the jury, that if, in a particular case, there are two modes of treatment respecting the adoption of either of which men of learning are equally divided, then no man can be said to be "grossly ignorant" in adopting a course which has received the approbation of eminent writers, and which his own judgment sanctions and approves. The accused was immediately acquitted.

In the same year, 1846, Parke, B., observed in his charge, that they (the jury) were not to expect from a country practitioner the same amount of eminent skill to be met with in large towns; but they had a right to expect from him the usual and ordinary amount of skill, care, and attention which it was only reasonable to suppose he would possess; and if, in the discharge of his duty, he applied his professional skill and knowledge to the best of his ability, then, however unfortunate the termination of the case, he was not to be visited with an action to mulct him for damages.

In the *Lancet* for June 22nd, 1901, p. 1792, will be found some excellent remarks on negligence, and it is there stated that the question "What is negligent conduct on the part of a physician or surgeon?" is one of fact rather than law, *i.e.*, each case must be judged absolutely on its own merits, and cannot be established by reference to any hard-and-fast legal rules or standard of merit.

In America the correct rule has been said to be that a physician and surgeon when employed in his professional capacity is required to exercise that degree of knowledge, skill, and care which physicians and surgeons practising in similar localities ordinarily possess (see *Dunbauld* v. *Thomas*, "Am. Law Dig.," 1900, p. 3656).

The following American cases are useful instances :—

Thus in *Edwards* v. *Lamb* ("Am. Law Dig.," 1900, p. 3656), where the plaintiff, under the direction of the defendant, assisted in dressing a wound of her husband and became infected with poison by reason of slight scratches on her fingers, the defendant, who knew of the danger, was found to be guilty of negligence in assuring her that there was none, since he was not justified in assuming that her hands were free from such wounds. In another extraordinary case it was decided that a physician is under no obligation while a person is his patient to tell her or her husband that a fragment of a needle, broken in a surgical operation, was left in her body, but it is his duty to tell her so when discharging her as his patient from his care (*Eislein* v. *Palmer*, "Am. Law Dig.," 1899, p. 1870).

The article proceeds :—

While the liability of a hospital surgeon for his personal acts has been left unsettled, it has been decided that a hospital surgeon is not liable for the acts or defaults of nurses in the hospital to whom the more minute care of the patients is entrusted.

Thus, in the case of *Perionowsky* v. *Freeman* (4 F. & F. 977), the plaintiff, who had been a patient at a London hospital, sued two of the surgeons for maltreatment there by causing him to be placed in a bath so hot that he was scalded and injured. It was proved that the bath had been ordered by the defendants, but that it had been actually administered by the nurses. Chief Justice Cockburn, in leaving the case to the jury, said : "The defendants cannot be held liable for the negligence of the nurses unless they were near enough to be aware of it and to prevent it. No doubt persons who go as patients into hospitals are not to be treated with negligence, but, on the other hand, medical gentlemen who give their services gratuitously are not to be made liable for negligence for which they are not personally responsible. A verdict was returned for the defendants.

So much is generally left to the nurses and attendants at a hospital that the above case will serve to relieve the staff of much responsibility.

Passing on to consider a few cases of more recent date, it is interesting to notice that, save in cases of exceptional hardship, juries seem to be inclined to decide actions for professional negligence in favour of the practitioner.

A case of very considerable interest both to the profession and the public was heard at the Manchester Winter Assizes, 1903. The plaintiffs were a Mr. and Mrs. Hall of Oldham, and their claim was against the Oldham Nursing Association, the defendants being the committee of management thereof. This association, it was stated, is a voluntary and philanthropic body, and the association differs from a nurses' home in that it is not carried on for profit. It appears that in January last Mrs. Hall underwent an operation, and whilst under the anæsthetic, either during the operation or immediately after its completion, hot bottles were used (as the plaintiff alleged) insufficiently protected, with the result that the patient's legs were seriously burned. The nurses were supplied by the association. For the Nursing Association it was contended that when a nurse went out to a case, she passed from under the control of the committee, and was at the disposal of the person engaging her. The jury returned a verdict for the plaintiffs, and they found in answer to questions left to them by the judge, first, that the injury to the female plaintiff was caused by negligence on the part of the nurses; and secondly, that the association undertook to nurse her, through the agency of the two nurses as their servant. The damages asked were 190*l.*, but the jury awarded 300*l.* The judge—Mr. Justice Jelf—expressed his entire agreement with the jury on the facts which they found. The judge refused to grant a "stay" in the case, but it may be carried further. *B. M. J.*, 2, 1903, p. 1374.

The appeal was heard at the Court of Appeal, July 16th, 1904, and the verdict reversed by the Master of the Rolls and Lords Justices Stirling and Mathew.

The Master of the Rolls, in giving judgment, said that it was an interesting case and of some public importance, as it had to do with matters which were very common and in which the community at large was much interested. The defendants were an association of persons who from philanthropic motives had organised a system by which they were enabled to supply nurses to people who needed them, patients who could pay doing so, and those who could not being attended free of charge. Plaintiff was able to pay, and did so. If the association undertook to nurse the patient, then it was responsible for any failure of ordinary care and skill on the part of the persons by and through whom it carried out the nursing. If, on the other hand, it only contracted to supply a competent nurse, then if it exercised ordinary skill and care in selecting that nurse, the responsibility of the association came to an end there. The whole of the obligation accepted by the association was to take all due care and skill in selecting the nurses, who, when sent to cases, were under the direction of the patients' medical attendant, whose instructions they had to obey implicitly. The association was not liable for the negligence.

The other lords justices agreed, and the appeal was allowed, the original verdict being set aside and judgment entered for the defendants, the damages and costs which had been paid to be returned.

In a case which occurred in March, 1899 (*B. M. J.*, March 18th, 1899, the plaintiff sought to recover damages from the defendant in respect of alleged negligence in his professional treatment of her. It appeared that he had opened an abscess and inserted a drainage-tube. This tube was afterwards missed, but it

was supposed that the patient had lost it when she removed the bandages. The wound eventually healed, but ultimately a second operation was performed by another practitioner, and a piece of indiarubber tubing was removed from the arm. The defendant denied that he had been guilty of any negligence. Corroborative evidence was given by two other practitioners, who said that it would not have been justifiable to slit up the sinus in order to search for the tube. The jury found a verdict for the defendant, whose case had been conducted by the Medical Defence Union.

Where the damages arise through some mistake against which no practitioner can at all times be on his guard, it is in the highest degree important that the defendant should be absolved from responsibility.

In *Russell* v. *Cree* (*B. M. J.*, March 17th, 1894, p. 608), the plaintiff, a clerk, sought to recover the sum of 24*l.* damages in the Clerkenwell County Court for the alleged negligence of the defendant, a medical practitioner, in certifying that "he was suffering from scarlet fever and was therefore unable to follow his profession." It turned out that he was in reality suffering from "erythema." It was shown that the case was extremely doubtful and that the spots visible were very deceptive. Judge Meadows White said that he could not see where the negligence came in and the action was dismissed.

In January, 1904, a somewhat similar case occurred, in which a medical man, suspecting a case to be small-pox, took the trouble to have the advice of the medical officer of health, after which he signed the certificate of small-pox. The case proved not to be small-pox and an action for damages was brought, but, naturally the verdict was for the defendant.

A case in which no consultation took place is thus reported in the *Lancet*, November 14th, 1903, p. 1380 :—

On November 3rd, Mr. J. M. Wheler, a medical man in practice at Battersea, appeared at the South-Western Police Court in answer to a summons for failing to notify a case of small-pox. There was no doubt as to the fact that a case of small-pox had been treated by Mr. Wheler as chicken-pox and that in consequence of this mistake other persons had become infected, but considerable question arose as to whether the defendant was aware of the nature of the disease to such an extent as to render him liable to conviction.

It was suggested by the Battersea Borough Council, acting as the prosecutors, that as Mr. Wheler apparently felt some doubt in the matter, he should have "taken advantage of the expert provided"—namely, the medical officer of health of the district—and that by failing to exercise all reasonable skill, he was guilty of negligence. Mr. Garrett, the magistrate who heard the case, differed from this view and refused to accept the contention that Mr. Wheler, because he might have felt a doubt, should have therefore notified the case as one of small-pox, pointing out that if a medical man, acting upon suspicion, caused the removal of a man suffering from chicken-pox to a small-pox hospital, the consequences would be very serious. He held that a medical man could not be expected to do more than to act to the best of his judgment, and, acquitting the defendant of all negligence, he dismissed the case. The suggestion that the medical officer of health is provided as an expert whom medical men can consult in cases of doubt where dangerous infectious disease is suspected is clearly wrong. This is not the legal position of the medical officer of health, and so long as his duties remain what they now are any assistance that he may afford in this way must be purely voluntary. To compel his attention and to obtain his opinion by notifying a case which may turn out not to be one of the disease suspected is a course which any medical man would

properly hesitate to take. The question of how far a medical officer of health should render assistance upon such occasions was gone into at some length in the *Lancet* of October 12th, 1901, p. 987, the occasion being the publication of some correspondence which had taken place between a medical man and a medical officer of health upon this very subject. In the course of that correspondence the latter wrote: "I am always pleased to assist my medical *confrères*, but you must understand that the diagnosis of cases is no part of the duty of a medical officer of health. The responsibility of diagnosis rests with the medical attendant entirely." This, we think, is a correct statement of the position. Whether some method should be devised to enable a medical practitioner to obtain the opinion of one more experienced than himself in the case of such a disease as small-pox is another matter. The power to do this would be a source of protection both to him and to the public. At present, with regard to his poorer patients who cannot afford to pay for a second opinion, the medical man has to bear the responsibility himself, being only able to strengthen his own opinion by invoking the assistance of a friend, should he be able to do so. Mr. Wheler was successfully defended in this case by the London and Counties Medical Protection Society, Limited.

For a case in which a practitioner was fined 5*l.* for failure to notify small-pox, *vide Lancet*, 1, 1904, p. 66.

The question must sometimes occur to the practitioner whether he is in duty bound to go on with a case after he has seen the patient once. Continued attention may, in some cases, prove very irksome, especially if the patient lives at a distance and is not a regular patient. The following Scotch case (*B. M. J.*, April 7th, 1894, p. 755), serves to show that while a medical man is not bound to continue attendance in an emergency case a jury may sometimes be persuaded to give damages. It appeared that the defender, as the nearest medical man, had been called in to attend a labourer who had sustained a fracture of the tibia of his right leg just above the ankle. Upon examination, the defender found that the man was not in a fit state to have the leg set and for several reasons he advised that he would be better at the Edinburgh Infirmary, six miles off. Having done up the pursuer's leg so as to guard it against the dangers of removal, he sent him to hospital, intimating at the same time that he would have nothing more to do with the case. He was not the regular attendant of the pursuer nor was he the surgeon for the mill at which the pursuer had been working. Further, the defender never entered the pursuer's name in his books nor did he ask any fee for what he had done. After seeing the pursuer, the defender was himself laid up with influenza for a month, when he again saw the pursuer, who had never been moved to the hospital. By that time the mischief had been done, and as the result of an operation which was then found necessary one leg was shorter than the other. Lord Adam, who charged the jury in an action brought against the defender for negligence, said that the case turned altogether on the question whether the defender undertook in November to give his continuous professional attendance to the pursuer. He also remarked: "Because a doctor attends a man in an emergency, it does not follow that he is bound to go on with the case. Unless it is proved that besides doing what he

did, he also undertook to treat the pursuer as his patient the obligation ceased." In spite of this very explicit direction, the jury returned a verdict for the pursuer with 50*l*. damages. Although the jury decided in favour of the plaintiff, the direction of the learned judge in the above case represents an accurate statement of the law, and it corresponds with the attitude taken up by American lawyers. In *Keller* v. *Lewis* (65 Ark. 578) a physician gave his services gratuitously to a patient who knew he was going away. It was held that he was responsible only for such treatment as he had administered personally and that he could not be held liable for any negligence or want of skill on the part of a physician who was subsequently called in.

Apart from the risk of having an action lodged against him for negligence the practitioner may also find his alleged negligence set up in answer to a claim for fees. It was long ago decided that if the defendant in such an action receives no benefit, *in consequence of the plaintiff's want of skill*, the latter cannot recover (*Kannen* v. *McMullen*, Peake, 59); but the remuneration of a practitioner who has used due skill and diligence does not depend on his effecting a cure. In the case of a surgeon, if an operation which might have been useful has failed in the event, he is nevertheless entitled to charge; but if it could have been useful in no event he has no claim (per Alderson, J., in *Hill* v. *Featherstonhaugh*, 7 Bing. 574).

From a report of the case of *Matcham* v. *Lacey* (*B. M. J.*, May 4th, 1901, p. 1121), it appears that at least one member of the county court bench takes the view that when a medical man undertakes a case he must go through with it to a finish, although the parents or other persons who have immediate control of the patient persistently refuse to take the medical man's advice. In the case under notice the plaintiff retired from a case on this ground and sued for his fees up to date. The learned judge found in favour of the defendants, remarking that a medical man is bound to continue in attendance upon a case which he takes up, and that if he leaves it at an early date he must forego his entire fee. It is very doubtful whether this is a correct statement of the law. If the medical attendant gives sufficient notice to his patient and entrusts the case to a brother practitioner in whom he has confidence, it would be hard indeed to find him guilty of negligence and so to deprive him of any reward, especially when his motive for leaving the bedside was his clear perception that those in charge persistently refused to take his advice or, although able to afford the fees, the patient's friends were determined not to pay. A solicitor will often refuse to proceed without a payment on account. A medical practitioner, although his doing so would not be consistent with the highest professional etiquette, should be allowed to take the same course in emergency.

Mr. Atkinson states (*loc. cit.*):—"A qualified assistant or *locum tenens* is thus, by being registered, responsible himself for any negligence that may be proven in his practice; he does not involve his principal. The matter is more complicated when unqualified assistants (students, nurses, etc.) are considered. If the principal was superintending the alleged negligent act of the assistant, then he is suable; but if in his absence the subordinate omits some precaution in some matter which is within, or in acting goes beyond, the scope of his specific employment

or directions, the principal will not be liable. A principal is not conjointly liable for his assistant's criminal acts unless he commends them or co-operates in their execution. But every error of an unqualified person does not imply punishment. Lord Hale said, 'If a physician or surgeon, even though he is not a regular or licensed one, acting with due care and skill gives his patient a potion or plaster intending to do him good, and contrary to the expectation of such physician or surgeon it kills him, this is neither murder nor manslaughter, but misadventure.'

"An unsettled point is the liability of the governors of a charitable hospital for the misfeasances of employés. The U.S.A. courts have decided that there is no liability if a competent staff is employed, and those aggrieved must seek personal redress from the operators.

"No case has been tried as to the liability of an anæsthetist for a death under an anæsthetic; liability might arise from neglecting the physical examination which is by rule made prior to the administration, or from leaving the patient before complete recovery of normal respiration. It is, however, still the objectionable regulation that all such cases must be sat upon by that most ancient English institution, the coroner's jury.

"If during an operation an unforeseen extension is seen to be inevitable, *e.g.*, the compulsory amputation of the leg when by mishap the popliteal artery is damaged during an arthrectomy, proof that such was in the opinion of the surgeon honestly necessary for the life or health of the patient would be sufficient to exonerate him.

"Treatment does not extend to a surgical operation without special consent; nor may the extent of the operation sanctioned be exceeded unless under very critical conditions. From this it follows that if a hospital patient, even in a surgical ward, declines to follow the surgeon's advice with respect to operative treatment, he cannot be compelled—he may be expelled. It is not easy to strictly define 'an operation'; it is technically a surgical 'battery,' the preparation and production of the instruments being the 'assault.' It appears logically that, *e.g.*, vaccination, antitoxin or hypodermic injections, tracheotomy, and catheterisation are all 'batteries,' and should be only performed after permission has been given."

The case of *Beattey* v. *Cullingworth* (1896), is of great interest in this connection. The plaintiff alleged that she expressly forbade the removal of both ovaries, though consenting to the removal of one. Dr. Cullingworth's position was—

1. The operation had been left to his discretion based upon the result of his exploration.

2. The double ovariotomy was at least necessary to prolong the nurse's life, if not to enable her to escape imminent danger.

3. The operation was not the cause of her sterility, as she was necessarily already sterile from her cysts.

The jury came to a peremptory conclusion—acquitting Dr. C., and adding, "that an action ought never to have been brought." Such opinion was upheld in the Appeal Court next year, and apparently by the House of Lords, who refused to allow the nurse to sue at their bar *in formâ pauperis*.

Several practical points are driven home by this case.

1. It is advisable to have a definite understanding, in writing if possible, as to the scope and possible results of your operative treatment, and it is best to have it stated clearly that the matter is left at your discretion to act when you have gained full information. More especially is this the case where a series of operations or examinations under anæsthetic is required.

2. If your patient is "under," and you see that you must exceed the limits of your permission, you must consult with the nearest relative at hand, or else be able to rely on the extreme necessity of the case, before proceeding.

3. Remember always that you are operating upon a possible plaintiff.

The medical man has no liability if the injury complained of is the result of intervening negligence contributed by the patient himself or by a third person, such as wilful disobedience to specific instructions. This question often arises in connection with murder trials, for if a man dies within 366 days after being feloniously attacked, his assailant is guilty of murder; it is neither an available plea that he refused treatment, nor that but for a surgical operation performed upon him with the hope of benefiting his condition he would have survived the "year and a day" limit. Where, owing to obvious maltreatment of the original wound, an operation was called for leading to a fatal termination, the assailant would probably be free from technical murder. Much discussion has arisen on these points, and many theoretical cases have been enunciated; *e.g.*, What if the fatal condition was not *propter*, but merely noticed *post* the alleged injury (*e.g.*, an aneurysm being first noticed after a blow might be mistaken for an abscess and opened with fatal result)?

Charges of malpraxis are found to be based upon two points, first errors in diagnosis, and secondly, errors in actual treatment; but it is obvious that in some cases very definite lines of treatment, often in opposite directions, have to be pursued on the basis of diagnosis, the two cannot therefore be altogether separated.

Errors in Diagnosis.—In diagnosis the commonest error that comes before the courts is mistaking a fracture for a sprain, and *vice versâ*. The Röntgen rays offer now a practically certain means of separating the two conditions, and it is sound practice to have a photograph of this nature taken of the parts in all cases of doubt. The cases of doubt are naturally those where the injury is either of a joint or of the bone very close to a joint. It is a very common result of fractures that deformity shall result, even with the most skilled treatment that modern surgery can suggest, and over this deformity disputes arise, it being set down to an error in diagnosis followed by improper treatment. Dislocation of the outer end of the collar-bone lately gave rise to a dispute of this nature, but the evidence of a well-known surgeon was able to prove that the plaintiff's case would not bear examination, and a verdict for the defendant resulted.

Sprains of the back, with persistent pain, have in at least one case been shown by the X rays to be due really to a fracture of a process of a lumbar vertebræ; such cases come more in the way of railway compensation cases than that of malpraxis, but they are to be noted.

The following is a very typical case reported in a provincial paper for July 18th, 1902, taken from the *B. M. J.*, vol. 2, 1902, p. 295.

At the last assizes in Nottingham, Thomas Webster, a collier, sued Dr. W. C. Rainsbury, before Mr. Justice Channell and a jury, to recover damages for alleged unskilful treatment.

Mr. Appleton appeared for the plaintiff, Mr. Hugo Young, K.C., and Mr. Wills (instructed by the solicitor to the Medical Defence Union) for the defendant.

According to a report in the *Nottingham Daily Guardian*, July 18th, it appeared that the plaintiff was a pitman employed at the Silverhill Colliery at Teversal. On November 26th, 1900, he met with an accident whereby he sustained an injury to his left arm. He thereupon consulted the defendant, who was medical officer to the sick club of which the plaintiff was a member. According to the plaintiff's case the defendant, after examining the arm, said that no bones were broken, and merely prescribed bathing and painting with iodine to reduce the swelling. In January, 1901, the plaintiff consulted one Taylor, a lamp cleaner at a neighbouring colliery who had a reputation as a bonesetter. He also consulted Mrs. Thorpe, another bonesetter. According to the plaintiff's case neither of these bonesetters would undertake his case as they said the elbow was dislocated, and that, as the injury was of old standing, they could not do anything with it. In the end, about a year after the accident, the plaintiff went to Charing Cross Hospital, where he was attended by Mr. Charles Gibbs, who performed an operation. The negligence alleged was in allowing the plaintiff to go about for six weeks with a broken arm. In cross-examination the plaintiff admitted that the defendant had recommended him to go to hospital. Proceedings were not commenced until March, 1902.

The defendant, in the course of his evidence, said that when the plaintiff came to him he complained of a swelling in the left arm. He had been unable to complete the diagnosis at the time owing to this. The plaintiff never told him that he had been to the bonesetters, and never complained of improper treatment.

A witness called for the defendant stated that the plaintiff had told him that when he (the plaintiff) visited one of the bonesetters he was pulled about "till knots of sweat stood out upon him as big as peas." Dr. J. P. Gray, Dr. W. H. Gray, and Mr. A. R. Anderson, F.R.C.S., consulting surgeon to the Nottingham General Hospital, were called in support of the defendant's case.

In the course of his summing-up Mr. Justice Channell pointed out to the jury that a country doctor was not expected to have as much skill as the surgeon of a London hospital. He was expected to have reasonable skill, and to exercise reasonable care in the treatment of his patients. The important question for them to determine was whether the defendant had reduced the dislocation. There was a difference of opinion as to the swelling, but the doctors all agreed that the swelling made a diagnosis difficult. The plaintiff said that the defendant told him there was no dislocation, but the defendant denied this. The evidence was that the plaintiff came up daily to see the doctor. After he had been away for a couple of days he came back with his arm out. The arm was out early in January; after the lapse of such a long time as that resetting had become impossible. It was clear that the plaintiff visited the bonesetters in January, and there was a conflict of evidence as to whether they had pulled him about. In serious cases it was the duty of a country doctor to send his patients to a hospital. Here the defendant said he had sent him, but the question was whether he had sent him early enough. His (the learned judge's) opinion was that the plaintiff's arm was out for some time before he went to the bonesetters, as he would not have gone if he had been all right. The plaintiff's evidence might be true in part and false in part.

The jury, after a short retirement, found a verdict for the plaintiff, damages 25*l*.

A case of somewhat similar nature came before the courts in June, 1901 (*Stocks and Crossman* v. *Watson*, K. B. Div., before Mr. Justice Bruce and a special jury).

Watson, in a bicycle accident, besides other injuries, sustained damage to his shoulder. The medical man asserted that he examined the shoulder carefully and failed to detect any dislocation until sometime after the accident. The defendants' witnesses swore that the examination was a careless one, with the coat still on. Mr. Clutton and Sir V. Horsley gave evidence to the effect that if the dislocation had been present at first it would have been detected by Stocks, and also that it

might have occurred sometime subsequently to the accident. After a very fair summing-up, the medical men obtained a verdict in their favour.

Vide also on this case, *Lancet*, 2, 1901, p. 876, where J. W. Rolph describes a similar course of events in two cases without medico-legal proceedings.

Neglect in Treatment.—The most frequent cases of this nature are those of confinements, tooth extraction, and neglect in operative procedures, tight bandaging, etc.

Dr. Taylor remarked: "Charges of manslaughter have been brought against medical practitioners in cases of midwifery. In some instances gross mismanagement has been proved; the uterus and even parts of the viscera have been torn away, and in such cases convictions have followed. It is well known, however, that much difference of opinion exists among the most eminent practitioners of midwifery respecting the treatment to be pursued in difficult cases." It is impossible here, as in other cases, to lay down any rules, but the following case shows one possible source of danger which can always be avoided, viz., a suspicion of being under the influence of alcohol when attending a case.

At Birkenhead a doctor was committed for manslaughter by a coroner's jury. The accused stated he was a qualified medical practitioner, and had twenty years' experience as a military doctor. When he first visited Mrs. Alcock he endeavoured to remove the placenta, but was not successful, as he was afraid to use force. He then prescribed a medicinal treatment, which he considered could not be excelled. He quite realised that if the placenta was not removed the woman would die. He gave the medicinal treatment in preference to what was medically known as the "heroic" treatment, as he did not want to be held responsible for the woman's death.

The coroner said he regretted to say that after his first attempt to remove the placenta Dr. —— did not take any further steps directly or indirectly to save the woman's life. The jury must bear in mind that a person could not be sent for trial for manslaughter unless guilty of culpable negligence.

The jury, after a long absence from court, returned a verdict of "Death from blood poisoning," and added that they considered Dr. —— should have called in another doctor to assist him.

The coroner said the jury had failed to answer the question he had put to them as to whether culpable blame could be attached to any one.

The foreman: We disagreed upon that point.

The coroner asked the jury to endeavour to arrive at a conclusion upon that point, and the jury again retired.

On the jury returning to court the foreman, in reply to the coroner, said they found there had been culpable negligence.

The members of the jury were proceeding to attach their signatures to the inquisition when a juror said he did not agree with a verdict of manslaughter.

Another juror said that there was a general agreement as to negligence, but three or four of them did not agree to manslaughter.

The coroner pointed out that if the jury said there was culpable negligence that was equivalent to a verdict of manslaughter. He asked the jury to decide definitely the point of negligence.

After a further retirement, making a total absence from court of an hour and a half, the jury returned a verdict of "Manslaughter."

Dr. —— was at the close of the inquest arrested on the coroner's warrant.

Dentists are not unfrequently proceeded against directly (or a counter-claim set up against a bill), for negligence in breaking off a portion of the jaw in tooth extraction, but such cases as the following are very unusual:—

A case of considerable interest came before Mr. Justice Kennedy and a special jury on April 10th, 1902, at the Glamorgan Assizes, in the form of a claim for

damages against Mr. J. C. Oliver, consulting dental surgeon at the Cardiff Infirmary, for alleged unskilful extraction of a tooth. The tooth in question was an upper canine, and it was alleged that "unnecessary force was used, with the result that the tooth was forced upwards into the cavity of the cheek, and became embedded in the cheek-bone and the cartilage of the nose, just below the lachrymal duct." There was no doubt subsequently that the tooth was not extracted, but the forceps slipping over the conical part of the tooth, forced it up under the skin near the corner of the eye. Swelling and pain followed, and the patient was seen by several medical men, who at first failed to diagnose the unique condition, and were, moreover, misled by the statement of the patient that the tooth had been extracted. The use of the Röntgen rays, however, clearly demonstrated the condition, and the tooth was removed by a simple skin incision. The evidence of the four medical men who examined the patient was against there having been any negligence in the attempted extraction, though it appears that the dentist in question had not ascertained whether the tooth was out or not.

His lordship held that if there was no negligence in the operation proper it did not matter about the failure to find the tooth.

The jury gave a verdict for the defendant.

In the following (*Lancet*, 1, 1895, p. 1221), the defendant was not so fortunate :—

In the Supreme Court, Sydney, Mr. Austin N. Cooper, F.R.C.S. Irel., of Tamworth, New South Wales, had an action brought against him for 2,000*l.* damages for negligent and unskilful treatment of a fractured elbow-joint. The alleged want of skill consisted in the arm having been kept in rigid splints for twelve days before passive motion was commenced. The defendant stated that he kept the splints on because the joint was too inflamed to be moved, and the boy could now move his arm through an angle of 45 degrees. Drs. MacCormack, Sydney Jones, Jamieson, and S. T. Knaggs gave evidence for Mr. Cooper and stated that there was no evidence of any malpractice or negligence. Dr. Jones had examined the arm and found good union, and that the joint could be moved over 45 degrees. Nevertheless the jury found for the plaintiff with 200*l.* damages.

The following case has a bearing on accident insurance policies as well as on malpraxis (*Lancet*, 1, 1903, p. 404) :—

At Bandon Quarter Sessions, before County Court Judge Bird, the remitted action brought by Patrick Byrne, labourer, of Innishannon, against Dr. John Reid was heard. The plaintiff sought to recover damages on the grounds that the defendant had treated him negligently and had not exhibited sufficient medical and surgical skill. The plaintiff suffered from fracture of two or three ribs and dislocation of the collar-bone, the result of a fall into a quarry. He sent for the late Mr. Alcock, who was the dispensary medical officer of the district, but as Mr. Alcock was absent on leave Dr. Reid attended as his substitute. The plaintiff in his evidence alleged that Dr. Reid had promised to call on the following day and not done so; the bandages had loosened and he suffered great pain. He stated that he still suffered from pain in the arm that he could not work as well as previously. Dr. Reid gave evidence to the effect that he had adopted the usual methods for treating injuries of the kind and impressed emphatically on the plaintiff that he had sustained an injury which could not be completely cured and that he should not afterwards blame him (the defendant) for the result. Professor C. Y. Pearson, of Cork, stated that the result of the treatment of this class of injury was scarcely ever successful; the muscles of the upper part of the plaintiff's arm were well nourished, from which he concluded that he had been using it pretty freely. Dr. J. Cotter, of Cork, gave similar evidence, and the judge having summed up, the jury, after deliberating for about forty minutes, brought in a verdict for the defendant. Judgment was accordingly marked for the defendant with costs.

Foreign Bodies left in the Wound or Abdominal Cavity.—Two very distressing cases of this kind have recently (in 1904) become subjects for inquiries and attracted considerable notice.

In the first, a well-known surgeon was called late at night to perform abdominal section for internal hæmorrhage. Through some mischance a pair of

forceps were left behind, necessitating a further operation, and the patient died from peritonitis. This case did not go beyond the coroner's court, and the discussion chiefly centred on the responsibility of the surgeon for counting the instruments used.

The jury brought in a verdict of death by misadventure, due to peritonitis, following on an operation, and accelerated by the presence of the forceps. They added the following rider: "We consider that the system of the hospital is largely at fault, and we recommend that instruments should be numbered and counted before and after each operation."

One question put to the surgeon is worth quoting as showing the drift of ideas in the mind of the questioner, "There was no hurrying over this patient in order to get on with another operation?" To this the surgeon replied, "Goodness, no! That is a monstrous suggestion."

The other was a similar case, only that in it a sponge and not forceps was left behind. The case was tried in the K. B. Div., June 6th, 1904, before Mr. Justice Bruce and a special jury. The following report appeared next day:—

In April of last year Mrs. B., who was suffering from an internal complaint, entered a nursing home at Regent's Park, where she underwent an operation—Miss T. being the surgeon. The operation appeared to have been successful, but later in the year Mrs. B. again became ill, and upon being operated upon in the Sussex County Hospital at Brighton, it was found that a mattress sponge which had been used in the first operation had been left in the body. Plaintiff contended that Miss T. had been guilty of negligence in not personally counting the sponges used during the operation.

Defendant denied negligence, and stated that it was the practice among many of the best operating surgeons to leave the counting of the sponges to a responsible nurse. She contended that the leaving of the sponge was a misadventure.

Mr. Dickens submitted that it would be unfair to throw the responsibility of counting upon the surgeon, who was expected to concentrate the whole of his attention upon the patient. Such a ruling might seriously harass operating surgeons in their work.

Mr. Clavell Salter said it was clearly the duty of a surgeon to see that the sponges were removed by checking the counting at the end of the operation.

Mr. Justice Bruce, in summing up, said there was no doubt the defendant was a very skilful surgeon. The questions which the jury had to decide were: (1) Was the defendant guilty of want of reasonable care in respect of the counting or the superintending of the counting of the sponges? (2) Was Mrs. P., the nurse, employed by the defendant to act as her assistant in the operation? (3) Was Mrs. P. guilty of negligence in counting the sponges? (4) Was the counting of the sponges a vital part of the operation which the defendant undertook to perform? (5) Was Mrs. P. under the control of the defendant during the operation?

After an absence of two hours the jury found that there had been lack of proper care in counting the "sponges"; that the nurse who committed the mistake had been employed by the defendant; that the counting was a vital part of the operation undertaken by the defendant: and, finally, that the nurse was under the control of the defendant. This, of course, was a definite verdict for the plaintiff, and involved the award of substantial, though not punitory, damages, and they awarded one farthing.

Mr. Justice Bruce said the damages awarded were quite inconsistent with the other findings of the jury, and he asked them to reconsider the point.

The jury again retired, and returned after an interval of fifteen minutes. The foreman then stated that in the opinion of the jury it was not a case for damages, because the operation had been performed without a fee.

Mr. Justice Bruce: That makes no difference in law. In view of the other findings there must at least be the damages for the second operation.

Mr. Dickens: The finding of the jury is quite consistent with the facts of the case.

Mr. Justice Bruce: Of course, if the jury insist upon their verdict it must be taken, but that will involve a new trial, and all the evidence will have to be gone through again. A farthing damages for such an operation seems to be perfectly absurd.

The jury retired once more, and returned in a few minutes.

The foreman: The jury consider that the plaintiff ought not to have more than 25*l.* in consideration of the pain and suffering of the second operation.

Mr. Justice Bruce, in entering judgment for 25*l.*, with costs, said he was glad they had returned a verdict which cast no reflection upon the defendant's skill.

Stay of execution was granted pending an appeal.

The following comments of the Press are fair and to the point:—

The jury in the action of *Byrne* v. *Thorne* had an unusually difficult task to perform in giving their verdict, and it speaks well for the conscientious spirit in which the average citizen regards his obligations that they showed so much hesitation in coming to a satisfactory agreement. There was little question that the physical injuries for which compensation was claimed were caused by an oversight on the part of the hospital staff, but, on the other hand, there was no evidence that the operation was unskilfully performed, or that there was any conscious negligence in attending to the patient. But the mishap was none the less due to the lack of precaution of one of the assistants engaged, and it was rightly held that the surgeon in charge of the case was responsible. Whilst the fullest appreciation may be felt for the difficulties of the operator, in matters of life and death it is necessary to insist upon the highest standard of care and supervision being exercised. The counting of the implements employed is an essential part of an operation, and one for which the person in authority should be answerable.

In the *B. M. J.*, May 14th, 1904, p. 1147, will be found an article dealing with the question, quoting Von Neugebauer as being able to have collected 188 similar cases.

Specialists on the throat are apt to get into trouble with specialists in the use of the throat, as in a case that occurred in Paris in March, 1904, which is thus reported :—

Over a year has elapsed since the singer was last heard, for a very good, or, rather, very unfortunate reason. His voice has completely gone. More than a year ago his throat was affected, and he consulted the defendant. The latter's treatment was of no avail, and the tenor's voice, at first only impaired, eventually disappeared altogether. The agonised singer, who can sing no more, lays the entire blame for his misfortune upon the doctor. He charges the latter with having bungled an operation performed on his throat, and having destroyed one of his vocal cords. He claims heavy damages accordingly from the specialist as compensation for injuries totally incapacitating him from practising his profession, in which he was highly paid. The doctor does not attempt to deny that the tenor has completely lost his voice, but strongly disclaims any responsibility in the matter. He says that the tenor's case was one in which medical science was of no avail, and that his vocal powers have been destroyed, not by want of proper care, but by the progress of an ineradicable disease.

A physician holding himself out as having special knowledge and skill in the treatment of particular diseases is bound to bring to the discharge of his duty to a patient employing him as such specialist not merely the average degree of skill possessed by general practitioners, but that special degree of skill and knowledge possessed by physicians who are specialists in the treatment of such disease, in the light of the present state of scientific knowledge. The question when a physician becomes a specialist is not one of law, but one of fact primarily for his own determination; but when he holds himself out as a specialist it becomes his duty to use that degree of skill which such a practitioner should possess.—*B. M. J.*, 2, 1903, p. 875.

Wrong application of Electricity. — New discoveries in medicine are not always without their drawbacks, as in the following cases :—

In January, 1904, in Dublin, before Mr. Justice Gibson and a special jury, an action was brought by a Galway bookseller, named McCullogh, against the Galway

Queen's College, and Dr. C., as his medical adviser, and a man named Haire, as the Röntgen ray manipulator of the college, for damages for the negligent and wrongful application of the rays to his son's knee. It appeared that the boy, who was aged seven years, stated that a needle had entered his knee and got broken, the head remaining inside. In order to discover its location the rays were prescribed first by direction of a Dr. Q., of Galway, now deceased, and subsequently by direction of Dr. C. The latter is a doctor in connection with the Galway Queen's College and the Galway County Hospital, which institutions have a working connection. The rays were kept in the Queen's College for educational purposes, but a practice had grown up of allowing the man in charge, Haire, to take radiographs for doctors in Galway. In the present case the radiographs were taken by Haire, who, on the advice of the president, personally charged a fee for taking the plates, and for the work a cheque was sent to the president, and indorsed and given by him to Haire. The boy's knee was exposed to the rays six times in December, 1902, but the needle was not localised. The knee got ulcerated later on, but in April, 1903, it was, by Dr. C.'s direction, radiographed four or five times again, but the needle was not detected. The boy was then sent to Dublin, and an X ray expert, on seeing the knee, refused to use the rays upon it. A severe burn, or dermatitis, broke in on the boy's knee, and this caused him considerable suffering. It was now healed, but medical evidence was given to the effect that it might break out again. For the plaintiff it was stated that the X ray operator had placed the X ray bulb within two or three inches of the boy's knee while he was taking the radiographs, and the exposures varied from twenty to thirty minutes. For the defence, the witnesses said that the bulb was not held within a lesser distance than six or seven inches. A great number of expert witnesses were examined on both sides, and in the result the jury found for the defendants on the general issue that there was no negligence.

In the King's Bench Division, before Mr. Justice Lawrance and a special jury, in May, 1904, heavy damages were given against Mr. E. A. C. Smith for improper treatment of a case of cancer by the X rays and high frequency currents. The jury found that the defendant did not consent to the use of the X rays, and that the treatment was improper, negligent, and unskilful. For the assault they awarded plaintiff 2*l.*, and on the counter-claim for improper treatment awarded Mr. Pare 100*l.* As 2*l.* was paid into court in respect of the assault, judgment was entered for the defendant on the claim and counter-claim.

The case of *Forsythe* v. *Law*, commented on in the *Lancet* of March 8th, 1902, p. 680, tried in the King's Bench Division, conveys a strong caution to medical men in their dealings with patients addicted to drug taking that they may not be accused by such of lending their aid to a continuance of the habit.

In 1904 the editor was consulted about a case in which a dentist had injected $\frac{1}{6}$ grain of cocaine for purposes of extraction of a tooth, and it was alleged that this dose had caused symptoms of chronic poisoning by cocaine. On the facts submitted to him there could be no hesitation in a decision in favour of the dentist. The case is fully reported under "Cocaine Poisoning."

The question of "infamous conduct in a professional sense" has no place in this work; it is purely a question of the conscience of the General Medical Council. The editor cannot close the subject of malpraxis without expressing an opinion that it is much to be desired that means might be found for allowing a physician or surgeon of repute to act in some way either as arbitrator or as assistant to the judge in trying such cases; the evidence given must of necessity be of a highly technical character, such as only a skilled medical man can appreciate properly and interpret to laymen.

ADMINISTRATION OF ANÆSTHETICS.

There is no case recorded in which either a criminal or civil successful action has been brought against a medical man on account of a death from general anæsthesia. This statement is creditable alike to the public, for its confidence in the general care which medical men take in administering anæsthetics, and to the profession for the care which justifies such confidence; but for all that the statement may not long remain true, for coroners have the power to inquire into any death that takes place under such circumstances, and the editor has personal assurance from one coroner that does, and intends to continue to, make at least preliminary inquiries into all deaths under anæsthetics coming within his cognisance (for one of his cases *vide B. M. J.*, 2, 1903, p. 944). The Coroners' Society has drawn up a set of questions, including the temperature of the operating theatre and several other technical points, to which the coroners' officers are expected to obtain replies, from which the coroner will draw his own conclusions as to whether he should proceed to hold an inquest or not.

The following, taken from the *B. M. J.*, 1, 1903, p. 115, is a case in point, though the actual cause of friction seems to have been the possible insult to a coroner's dignity by an early post-mortem without his sanction and authority.

THE CORONER AND THE DOCTORS.

Under the above heading a long report of an inquest held by Dr. A. Kinsey Morgan, the Bournemouth borough coroner, appears in the local Press concerning the death of a person who died whilst under the influence of chloroform, when he was about to be operated upon for appendicitis.

It appears that three medical men were engaged in the case, and that within about an hour after the death had taken place one of them telephoned to the coroner and acquainted him with what had occurred.

Dr. T. F. Gardner gave evidence at the inquest, and stated that the only chance of saving life was an operation, and that although it was a serious case, there was no special indication that an anæsthetic should not be administered. This was done with all the usual precautions, and when heart failure was noticed every effort was made to resuscitate the patient, but unfortunately without effect.

Dr. Harold Simmons, the police surgeon, made the necropsy, and stated that he found an incision eight inches long in the side of the abdomen, which had been made by someone after death, and he further found that there had been perforation of the bowel, and that death was due to heart failure.

On hearing that one of the medical men in attendance had evidently made the abdominal incision after death had taken place without receiving a post-mortem order, the coroner, without asking for any further medical explanation, expressed himself very strongly on the impropriety of this being done, pending the inquest, and without the previous permission of the coroner. He described it as tampering with the body, extraordinary behaviour, unjustifiable, morbid curiosity, interfering with the ends of justice, and contempt of court.

Such observations were naturally resented by the three medical men engaged in the case, and they replied to them in a joint letter, signed by each, fully and satisfactorily explaining what had taken place, with the consent and at the request of the patient's relatives and friends. It was merely an examination to ascertain the condition of the bowel, which was found to be perforated, and at the time they were not certain that the coroner would hold an inquest. We learn now that the explanations given have so far satisfied the coroner that no further action will be taken.

Gillies v. *Cunningham* (*Lancet*, vol. 1, 1903, p. 1067), is a case in which a widow brought an action for damages against a medical man for the loss of her husband, who died under an anæsthetic. The grounds of claim were that the deceased had

been given the anæsthetic against his will and whilst in an unprepared state to inhale it, having partaken of a hearty tea. No other medical man was present. Many practitioners of the highest repute gave evidence in refutation of the allegations, and the jury returned a verdict for the defendant.

The following case opens up a wide field of discussion, and should therefore be quoted in this work, though it is impossible to lay down any special laws on the subject. Each case must be dealt with on its merits as it arises.

An inquest was held at the North Cambridgeshire Hospital, Wisbech, by Mr. Coroner Welchman, upon the body of Joseph Wallis, a farm hand, who died in the hospital on February 6th. Evidence was given that on February 1st deceased was kicked in the abdomen by a horse. He complained of some pain, but went on with his work for about half an hour, after which he went indoors. Mr. T. H. Hills was called and attended deceased up to February 2nd, on the evening of which day the patient was admitted to the hospital. Dr. C. H. Gunson, the house surgeon, said that on admission there was no discoloration or abrasion, but there was a slight distension on the right side of the abdomen. By the evening of February 5th deceased had become very much worse, and an operation had to be performed. Mrs. Wallis was not communicated with with regard to the operation, but she knew of the patient's serious condition. Deceased had agreed to the operation himself. The cook at the hospital, who was deceased's niece, said that she had written to Mrs. Wallis on the evening of February 5th, but she said nothing about an operation. The jury returned a verdict of "Accidental death," and added as a rider, "That in the opinion of the jury the deceased's relatives should have been communicated with before the operation, and that in all serious cases in future the relatives ought to be communicated with." At a meeting of the hospital committee held on February 19th, the rider was discussed, and the committee unanimously resolved that they approved of the steps taken by the medical officers and that they were convinced that to have delayed the operation in order to communicate with the patient's wife would have been culpable on the part of the medical officers and prejudicial to the patient. The committee, while anxious to consult the nearest relatives before an operation, as is invariably done when possible, could not accept the rider, but preferred to trust in the judgment of the medical officers. It was also resolved that the resolution, the verdict, and the rider should be forwarded to the Home Secretary, in order that he might inquire into the matter, with a view to the removal of the rider from the records of the coroner's court.

On the one hand, an undoubted right belongs to patients and their friends to give or withhold consent to an operation, and yet on the other there is an equally undoubted duty on the part of a medical man to do his best to save life.

The editor feels it advisable to insert an earnest appeal to every medical man to insure himself in some Medical Defence Company. For even charity will not protect him from an unfounded charge, as the following inquest before Dr. Danford Thomas shows:—

It appeared that a man named Pollock, being in arrear with his rent, was ejected from his lodgings on March 22nd. He went with his wife to the house of a friend, where, in an underground kitchen, Mrs. Pollock gave birth to a child on March 23rd. After the birth Dr. Stitt, of Cambridge Place, Regent's Park, saw the mother seven times without any charge. Becoming dissatisfied with Dr. Stitt, Pollock then called in a person described as a dispenser, who prescribed for Mrs. Pollock. On March 31st, Dr. Griffith, Dr. Stitt's partner, found Mrs. Pollock in such a serious condition that he advised her removal to St. Pancras Poor-law Infirmary, where she died on April 3rd. Pollock then sent a letter to Dr. Stitt, accusing him of gross carelessness and demanding compensation. He subsequently threatened to report the matter to the coroner. Dr. Stitt, who had, in the meantime, consulted the Medical Defence Union, refused to pay anything. At the inquest, where Dr. Stitt was represented by Mr. Hempson, Dr. Dunlop, medical

superintendent of the infirmary, who had made a necropsy, said that there were no signs whatever of any medical neglect. Death was due to peritonitis, caused by septic poisoning. It was probably due to the insanitary surroundings in which the patient had lain for eight days. The jury returned a verdict in accordance with the medical evidence, and the coroner advised the husband to withdraw the letter which he had written to Dr. Stitt (*Brit. Med. Jour.*, 1, 1904, p. 927).

QUACKERY.

As a subdivision of malpraxis a word or two should be said about quackery. For a definition of a quack, *vide* Court of Appeal, *Dakhyl* v. *Labouchere*, *Times*, July 29, 1904. Such is the general tendency of public opinion in England and such the incompleteness of our Medical Acts that quackery is rampant in every possible direction, and but rarely brings itself within the clutches of the law. Medical evidence is sometimes required when a blatant quack has overstepped his limits—signed a death certificate, for instance—but it is practically unknown for there to be any difficulty about such evidence, at any rate, in the minds of all self-respecting medical men. The subject need not, therefore, be very fully discussed.

Abortion mongers are fully discussed under the head of abortion.

Apparently the only way the law can touch quacks is under an action for obtaining money under the false pretences that they are registered persons, of which the following is an example :—

ELECTRO VIGOUR.

Prosecution of an Unregistered Practitioner.

Lewis Bailles, 164, Strand, appeared before Mr. Marsham, at Bow Street Police Court, on October 13th, to a summons charging him with wilfully and falsely pretending to be a doctor, and using the name and title of "doctor" in such a way as to imply that he was registered under the Medical Act, 1858. A second summons charged him with unlawfully using the title and description of "M.B.," thereby implying that he was a Bachelor of Medicine.

Mr. Bodkin prosecuted on behalf of the Medical Defence Union. Mr. Claude M. Treadwell appeared for the defendant, who pleaded "Guilty" to both charges.

Mr. Bodkin explained that the defendant was connected with what was called the McLaughlin Company, which carried on its business at 164, Strand. They advertised what they called their electro vigour treatment in the *Times*, *Daily Telegraph*, *Daily Mail*, *Daily Express*, and other papers, whose position gave the advertisements a certain amount of weight. In these advertisements the electric belt was alluded to as a rapid cure for almost every known and unknown disease to which humanity was liable. Readers were invited to go to 164, Strand, to see this wonderful appliance, and told that if they did so they would be under the care of a qualified physician. Those who could not call were invited to send for an illustrated book, which would explain how they could cure themselves at their own homes. In July last Mr. Tyrrell, a solicitor's clerk, was sent to 164, Strand, and represented to the defendant that he had called on behalf of a friend, whose symptoms he described. The defendant told Mr. Tyrrell that he had been a ship's doctor, that he held four medical qualifications, and was in the habit of prescribing drugs when necessary. On September 21st Frederick Downes Whitwell, another clerk, went to 164, Strand, to consult the defendant. After attending to several other persons in a private room, the defendant examined Mr. Whitwell, using a stethoscope. He came to the conclusion that he was suffering from a weak heart, and enlarged liver, and recommended him to buy a ten-guinea electric belt, which he was willing to sell for 3*l*. Mr. Whitwell asked the defendant to give him his name, and he wrote "L. Bailles, M.A., M.B." Mr. Bodkin went on to say that the defendant's real name was Lewis Lamb Bailes. In 1894 he was on the *Register* as Bachelor of Surgery and Bachelor of Medicine of the University of Durham,

but in July of that year he was sentenced to five years' penal servitude for rape. The General Medical Council struck him off the *Register*, and all his University degrees were taken from him. Moreover, his name was removed from the *Calendar* of the University of Durham. In spito of this tho defendant, after being liberated from prison, advertised himself as a Bachelor of Medicine. It has been held, said Mr. Bodkin, that it was a very serious thing for a man of very bad character to hold himself out to be a member of an honourable profession, and he hoped the magistrate—bearing in mind that this advertising scheme had proved very profitable—would impose a substantial fine, and make the defendant pay the costs of the proseeution.

Mr. Treadwell said the defendant knew he was not entitled to act as a doctor in the ordinary way, but thought he was at liberty to work for a company as a servant. That was what he had done. He was simply a servant of the company, and was not responsible for their advertisements. Of course his view of the law was wrong, but he hoped it would be accepted in mitigation of punishment.

Mr. Marsham said the defendant appeared to be the only medical man eonnected with the company.

Mr. Treadwell said he had reason to believe that was not so. The defendant told him he had only been associated with the company about three months.

Mr. Marsham wished to know if the belts had done anyone any harm.

Mr. Bodkin: I am given to understand that the belts are so absolutely free from electricity in any possible way that you might just as well wrap a pieee of paper round a man's body.

Mr. Marsham: Then they did no harm?

Mr. Bodkin: Except that these people were asking ten guineas for a belt which was absolutely worthless.

Mr. Tyrrell, one of the clerks referred to, said that when he called at 164, Strand, the defendant told him it was one of the happiest days of his life, because he had been consulted by so many people. He said he had been there about twelve months, and was going to have another doctor to assist him on the following week, as he found it impossible to cope with all the correspondence although he had twenty-five typewriters.

Mr. Marsham said the defendant must have known he was doing wrong, and ordered him to pay on tho first summons 20*l*. and 21*l*. eosts, in default two months. On the seeond summons the defendant was fined 5*l*., in default twenty-one days. The money was paid (*B. M. J.*, 2, 1903, p. 1022; also *ibid.*, p. 1182).

With regard to "quacks," their position was well stated in the Indian Oculists' Case (1893):

"If you think these men deliberately performed these operations with the full knowledge that that which they were doing was useless, unnecessary, and cruel, as the skilled surgeons tell you, you cannot resist the conclusion that the intention they had was to defraud. If you think that this is not established, then they are entitled to be set free."

As "quacks" they had no ability to raise the presumption that *primâ facie* they were skilled and competent. They had to commence their defence *ab initio*. The following are the classes of cases in which a charge of gross negligence has been sustained:—Where recklessness, stupidity, or manifest ignorance in an essential matter has been displayed, *or* where some wilful injury has been effected, *e.g.*, by way of experimentation, or by treatment otherwise than for the patient's benefit, or by treatment when the practitioner was not in a sober condition. It is an established position that you may not experiment on a patient, or rather that you experiment at your peril.

Quackery does comparatively little harm so long as adults only consult them of their own choice, but the matter assumes a much more serious aspect when helpless children are consigned to the care of

faith-healers, etc. The law seems utterly powerless to check this horrible practice, *vide B. M. J.*, 2, 1903, p. 1185, where a man was fined a miserable 20*l.* for unlawfully and wilfully neglecting his child of five years of age by trusting to faith-healing. Another fatal case, with no penalty, is reported in the *Lancet*, 2, 1903, p. 1455. For other cases of blatant quackery, *vide Lancet*, 2, 1903, p. 199, *B. M. J.*, 2, 1903, p. 1313, and in same volume a case of bonesetter *v.* doctor.

For an impudent case of practice by a disregistered medical man in which the jury as usual bolstered up quack pretensions, *vide B. M. J.*, 2, 1903, p. 56.

The following article on this subject, from the *Lancet*, 2, 1903, p. 1446, is well worth insertion here :—

In England the followers of Mrs. Eddy have long exercised a wise discretion in the matter of procuring for the children under their control that medical aid with which they must themselves dispense if they would faithfully obey the precepts of their prophetess. They have, in short, been aware that to neglect to procure medical aid for a child might involve them in a serious criminal charge, and they have accordingly obtained it. In Canada they will now presumably follow the same course, for the Court of Appeal of Ontario has held in the case of a "Christian scientist" that medical aid is a "necessary" within the meaning of a section of the Criminal Code of the colony which makes a parent liable for omitting to provide necessaries for a child under sixteen years, and that where death follows the omission the parent may be convicted of manslaughter. In England, under the Poor Law Amendment Act, 1868, it used to be an offence for any person "wilfully to neglect to provide adequate food, clothes, medical aid, or lodging" for his child, whereby the child should be, or should be likely to be, seriously injured. This section, which apparently contained an attempt to define the "necessaries" referred to in the Canadian Code, is now repealed, and under the Prevention of Cruelty to Children Act, 1894, any person having the custody or care of any child is guilty of a misdemeanour if he or she "wilfully neglects such child in a manner likely to cause such child unnecessary suffering or injury to its health." The omission of any direct reference to medical aid in the newer Act rendered it necessary to have recourse to the Court for Crown Cases Reserved in a faith-healing case where death had resulted. In that case (*R.* v. *Senior*, (1899) 1 Q. B. 283) Lord Russell of Killowen, L.C.J., pointed out that "it would be an odd result if we were obliged to come to the conclusion that in dealing with such a subject as the protection of children the law had meant to take what may be described as a retrograde step"; and the court unanimously upheld the conviction for manslaughter. In the case before the Court of Appeal of Ontario the indictment was under a section of the Criminal Code of Canada (Statutes of Canada, 55 & 56 Vict. c. 29, s. 210, sub-s. 1), which is as follows:— "Everyone, who as a parent, guardian, or head of a family, is under a legal duty to provide necessaries for any child under the age of sixteen years, is criminally responsible for omitting, without lawful excuse, to do so while such a child remains a member of his or her household, whether such child is helpless or not, if the death of such child is caused, or if his life is endangered or his health is or is likely to be permanently injured by such omission." The questions raised upon this were whether the term "necessaries" included medical treatment and whether the chief justice of the King's Bench Division of Ontario, the Hon. Glenholme Falconbridge, who tried the case, had rightly directed the jury that the evidence of witnesses that they had been cured or benefited by "Christian science" treatment had no bearing on the case except as showing the good faith of the prisoner. In deciding the first in the affirmative the Hon. Charles Moss, chief justice of the Court of Appeal, Ontario, laid down that "what is included in necessaries is to be determined upon the circumstances of each case, and whether there has been neglect to supply them must also depend upon the circumstances." This would protect the parent who, believing his child's case to be of a trifling nature, did not consider medical aid to be necessary, although, in fact, it was necessary, and would leave for the jury the question whether in all the circumstances of the case "medical assistance and treatment were necessaries proper to be provided for the child, having regard to the

state and condition in which the evidence showed him to be." With regard to the evidence of "Christian science cures" the learned chief justice held that they were properly excluded from the jury's consideration upon the main issue as to whether necessaries had been provided or not, and that as the good faith of the prisoner was not in question the evidence could not have been received at all. This eminently sensible and satisfactory decision should result in the saving of an appreciable number of children from death or injury to their health at the hands of "Christian scientists" and other absurd but dangerous people, although the section of the Code which it interprets does not go so far as the British Act, which makes penal the causing of "unnecessary suffering." Both the decision in *R.* v. *Lewis*, the case before the Court of Ontario, and that in *R.* v. *Senior*, referred to above, are, however, no more than we were entitled to expect. A serious slur would be cast upon medical science in the present day if our law courts refused to recognise its aid as necessary in cases of serious illness or injury where relief is desired or denied its power to alleviate suffering.

SECTION IV.

IDENTITY.

IDENTIFICATION OF LIVING PERSONS AND HUMAN REMAINS. BLOOD AND SEMEN.

The necessity for the identification of individuals is a matter of absolutely every day occurrence throughout all our criminal and other courts, and probably cases of mistaken identity are very numerous indeed, but none have been so notorious as the recent one of Adolf Beck in 1903-4. The case is still in a measure *sub judice*, but it has been fully recognised that a mistake was made. A full account of the legal difficulties in the case is given in a leader in the *Times* newspaper for August 19th, 1904. The editor has no exact information as to the points relied upon for identity; they seem to have consisted chiefly in the general likeness of hair on the face, similarity of features, etc., so far as the common witnesses (chiefly low-class women) were concerned. On the scientific side, identity of handwriting was the chief point relied upon. On the medical side, the principal fact was that Beck had not been circumcised, and was therefore not a Jew. On the legal side, however, the principal interest of the case centres, for the medical evidence (as also a perfect *alibi*) seems to have been ignored or ruled out of court. The fact remains that an innocent man suffered penal servitude through mistaken identity, and that this arose not from *medico*-legal defects, but through legal technicalities and police obstinacy, and need not, therefore, be given more in detail here.

The points that go to make up the identity of a living human being or the remains of one when dead and the questions that may arise in connection with these points are very numerous indeed. Some of them can only be determined and answered by a medical man, some lie more in the province of a detective, while others can be attested by any observant witness as well as by either of the above. Most of these points again have other important connections in legal medicine, but there is no other link than identity which connects them so well for exposition, and they will therefore be considered *seriatim* once for all in this connection, the more strictly medical ones at full length, the others only in their more salient features.

For more convenient reference an epitome of the points to be considered is here given, and the order in which they will be considered. There is no *logical* serial order in which to arrange them, for they have no special connection with one another, and the order of importance will differ very much according to the nature of the case.

Identification may be required of—
(A) A living person or one recently dead.
(B) Mutilated or fragmentary remains.
(C) Bones only.
The means available for identification are as follows:

1. Mental power.
2. Memory.
3. Education.
4. Speech.
5. Gait.
6. Handwriting.

These can obviously be used only in relation to a person actually living at the time of inquiry.

7. Complexion.
8. Likeness of features.
9. Occupation marks.
10. Race.
11. Deformities, birth marks, peculiarities of nails, etc.
12. Injuries leaving permanent results.
13. Clothes, jewellery, and articles in pockets.
14. Bertillon measurements.
15. Galton's thumb-marks.
16. Stains, smears, etc.
17. Stature, weight.
18. Teeth.
19. Scars and tattoo marks.
20. Sex.
21. Hair.
22. Age.

Of these some can be used in the living or the very recently dead, others in those dead for a longer time. Many of these points have other interest than that of mere identification; they will be discussed here under the reference numbers once for all in every bearing, so as to avoid repetition.

In Class B.

23. *Vide post*, No. 23, p. 197.

In Class C.

24. *Vide post*, No. 24, p. 204.

Before mentioning any details attention must be drawn very specially to a principle of probabilities in logic or evidence; it is the law of multiplicity of evidence, and may be thus stated:—Supposing one witness or fact testifies to a certain thing, or points to a certain conclusion, then if a second *independent* witness or fact testifies in the same direction the probability of the conclusion being correct is more than doubled; and if a third *independent* person or piece of evidence corroborates the first two, the probability of the conclusion being correct has a yet still higher multiplying factor, and in ordinary cases may be accepted as a certainty. This principle has a wide field of application in all medico-legal questions, but some especially typical examples will be noted amongst the following points in identity.

1, 2, 3. **Mental Power, Memory, and Education.**—These three points are essentially ones that require no detailed discussion in

a work on legal medicine; they come within the province of the ordinary intelligent witness. They assumed a very high degree of importance in the cross-examination of the claimant to the Tichborne estates in 1872 and 1873 (the case offered some distinctly medical points; *vide* below, p. 151), which occupied the court for some weeks. The intention of counsel was to show that the claimant was a man of poor mental power, inferior memory, and slight education, while the real Roger Tichborne was a man of good mental capacity, fair memory, and well educated. *Vide* also under "Lunacy," where the same points are of importance.

4. **Speech.**—Stammering, stuttering, and lisping are the most obvious peculiarities, and may under certain circumstances, as when people are heard quarrelling or in excited conversation, become of importance in identification. To recognise a person by the voice alone would be a risky proceeding in a criminal charge, though it is often enough accepted upon less important occasions. A question might be asked of a medical man whether a stutter for which there was no organic cause was curable. To this an unhesitating reply in the affirmative must be given, two or three of such cases having come within the editor's personal knowledge. He might also be asked whether an operation could cure a case for which there was some deformity of the mouth to account. To this a more cautious reply must be given, according to the nature of the organic defect: a cleft palate, for instance, can most likely be remedied by operation; but much would depend upon the age of the patient in answering the question, "How far would the voice alter and improve if the operation were successful?" In a case where damages were claimed by some one whose living depended upon the voice, it is possible that a great difference of medical opinion might arise. No general rule can be laid down upon the subject; each case must be judged upon its own merits. The *timbre* of a voice, which constitutes the means by which we, unconsciously perhaps, judge voices, depends very largely on the number and character of the overtones, and these may easily be altered by disease or accident.

There are certain kinds of speech dependent upon nerve diseases, *e.g.* disseminated sclerosis, or general paralysis of the insane, upon which a medical opinion might be asked in a court of law, but they belong too much to the domain of general medicine to require further notice here.

5. **Gait.**—We are constantly in the habit of recognising friends and acquaintances by the character of their gait, but it is even less reliable than the voice as the sole evidence of identity, and must be spoken of as such. Lameness or other disability in walking might require a medical opinion to elucidate its cause, especially if malingering were suspected. Thus the editor had once to examine the case of a labourer who had broken his leg and was still lame after nearly nine months. The explanation lay in the obliquity of the fracture of the tibia, which threw a very great stress on the line of union, as the lower fragment offered no support to the upper when the weight of the body was thrown upon it (*vide* "Workmen's Compensation Act").

6. **Handwriting.**—There exists a class of experts in this subject. Though any of them will soon demonstrate most peculiar points in a manuscript, points that an ordinary observer would entirely overlook,

there is commonly so much difference of opinion between the experts on the two sides of a case over the detailed minutiæ that but little absolute reliance is usually placed upon such evidence. The matter is, however, almost entirely non-medical, and it can only be in an extraordinarily rare case that a medical man could be asked to swear to the handwriting of a person, asked, that is, as an expert in medicine. It must, however, be mentioned that the committal of ideas to paper is frequently one of the most difficult tasks a lunatic can be asked to perform, and hence "writing out his case" is an excellent test for lunacy in many cases. (*Vide* "Lunacy," "Aphasia," and "Agraphia").

7. **Complexion.**—An obvious consideration in the living and even in the recently dead. The differences between the extremes of brunette and blonde are marked enough, but all such points as pale, florid, sallow, etc., soon disappear or alter after death. Organic changes in the skin, such as freckles, pimples, etc., are more enduring, and are likely to be recognisable for some little time after death, provided decomposition has not advanced very far. In judging of the common colour of the complexion it is most important that the individual, alive or dead, be examined by ordinary daylight, for in the usual forms of artificial light, with a large preponderance of yellow rays, the finer shades of skin colour are quite indistinguishable, and even deep jaundice cannot be appreciated without great difficulty.

8. **Likeness of Features.**—During life the general expression of the face can be so readily altered by voluntary power that mistakes can be easily made. The notorious Charles Peace, who was executed some years ago, was so clever at disguising his features by voluntary movements that he was frequently able to converse without discovery with detectives who knew him. After death such voluntary alteration is, of course, impossible; but death so speedily alters expression that too much reliance must not be placed upon this mode of identification (*vide* p. 287). Photography again is notoriously an unreliable method of identification unless minute details are considered.

The details of features are, however, more enduring and more satisfactory as evidence of identity. The colour of the irides, possibly different in the two eyes, or with peculiar segments in them, the size of the ears and their lobes, the length of the nose, the shape of the chin, lend themselves to exact observation and even measurement, and may lead to definite results in identification. An artist or draughtsman is, however, much better qualified than a medical man to speak to such details. Hence in bastardy cases a medical witness must be cautious in drawing deductions from an alleged likeness between the child and the putative father.

9. **Occupation Marks.**—These are of two classes: (*a*) stains, etc., of recent occupation (*vide* below under "Stains"); (*b*) more permanent organic changes in fingers, etc., which may receive brief notice here. They are, generally speaking, of more value when the body of an unknown person is found under suspicious circumstances than in questions connected with living persons, though in the latter they may afford useful evidence, corroborative or otherwise of the tale of a prisoner. The horny-handed son of toil can be thus easily distinguished from one who has not performed much manual labour; the callosities on a bricklayer's thumb, those on a harpist's fingers, are

examples of more particular trades; the depressed lower end of the sternum in boot-lasters may also be instanced, as well as bursæ on the outer malleoli of tailors. There are doubtless many other examples, but the matter is hardly a medical one and need not be pursued any further.

10. **Race.**—This is a gross method of identification which is not infrequently of use in seaport towns. The hair (*vide* under "Hair"); the skin, black in the Negro and some other races, dark brown in Indians and some other aboriginal races, yellow in Mongolians; the lips, varying in thickness and shape, are all useful for identification if decomposition has not proceeded too far. If bones alone are found the skull is the only part at all likely to be of assistanee, unless at least an arm and a leg (bones) are available. There are differences according to whether the individual was of the Caueasian, Mongolian, or Negro raee.

The differences chiefly relate to the proportion whieh the skull bears to the face, and the relative lengths of the upper and lower extremities. In the Caucasian the skull is rounded, the forehead raised, and the facial portion small in proportion to it. In the Mongolian the upper and lower extremities are small, the cranium more of a square form, the forehead inclined, and the face large and flattened, the malar bones being speeially prominent. In the Negro the proportions of the skeleton are smaller in the lumbar and pelvic regions; the upper extremities are long in proportion to the body, and the forearm and leg are large in proportion to the arm and thigh; the hands are small, the feet wide and flat, and the heel-bones project much backwards; the skull is narrow and elongated, the forehead small and compressed; the malar bones and jaws project; and the teeth are placed obliquely, so as to form a considerable angle at their point of union. The most marked characteristies exist in the configuration of the skull; but the skull of Ho Loo (a Chinese), in the museum of Guy's Hospital, scarcely possesses the characters assigned to the Mongolian; it closely resembles the skull of the Caucasian. That of the Negro may be more clearly identified. The skull of the Hindoo is a mixture of the Negro and Caucasian. It would be difficult, if not impossible, to pronounce an opinion on the race to which the skeleton belonged from a few detaehed bones or parts of bones.

11. **Deformities and Birth-marks.**—These are most important, and must be very carefully noted in the external examination of a dead body, as well as in deseribing the person of a living individual. Moles, nævi, port wine stains, are all distinetive marks, easily seen on babies and young children, noted and remembered by nurses and mothers, and frequently (*e.g.*, in Arthur Orton's case) used as means of identification in later years, when prolonged periods of separation have altered the features of a ehild's faee beyond recognition. Here we get an exeellent illustration of the principle of multiplieity of evidenee enunciated above. Thus one small birth-mark of any particular shape, say on arm or face, is common enough, but to get two of partieular shapes on particular parts of the body agreeing with known marks on an individual is very rare, and if it were found that a eorpse or living individual possessed three such peculiar marks, it would be a praetical certainty that it or he was the actual individual who was previously

known to have three such peculiar marks. Club-foot, harelip, cleft palate, congenital losses of limbs or parts of them, permanently split nails, congenital dislocations, etc., etc., are further illustrations of identifying deformities.

A case is reported by Beck in which a girl, Salomé Muller, had been sold as a slave, but her identity as the child of German parents was proved after fifteen years by two marks resembling moles, about the size of coffee-grains, on the inside of the thighs. They were proved to have existed in the child, and to exist in the same parts of the body of the girl eighteen years afterwards. After much litigation she was, upon this evidence, pronounced to be a free woman ("Med. Jur.," vol. 1, p. 662).

12. **Injuries leaving Permanent Results.**—Scars and tattoo marks (*vide* below) really come under this head, and so do ununited or badly united fractures of bones (*vide* p. 213). Surgical amputations and operations on joints form, perhaps, the best remaining illustration; but these are so common that, standing alone, they would be of small value. Associated with other points, they might acquire increased importance. The history of their occurrence might be very useful as corroborative evidence.

13. **Clothes, Jewellery, and Articles in the Pockets.**—As points of identification these are comparatively weak, firstly because all of them are manufactured in large quantities of such identical nature as to defy individual recognition, and secondly because they are all so easily changed under given circumstances. Nevertheless a most careful inventory must be kept of such articles when found on or by a corpse, as they may become of the greatest importance.

In the summer of 1903, Miss Fanny Hickman, a lady doctor, disappeared. Some two months later a body was found in Richmond Park very much decomposed. The medical evidence on her case will be found in full under the heading of Decomposition. In the present connection the interest in the case lies in the fact that the strongest items in identification were her clothes, a watch and chain, and two bronze medals, one of which, at least, had her name upon it. These were all positively sworn to by her maid.

14. **Bertillon's Measurements.**—With the exact details of this means of identification the editor has no acquaintance. The system is said to work very well in France for the identification of criminals, but it has no practical connection with medical men, and therefore may be here passed over with a brief explanation of its principles. It is founded absolutely on the law of multiple evidence, and consists in taking exact measurements of distances between bony points or of parts of the anatomy which do not vary when adult age is reached. A definite fixed order in which the measurements are referred to must of course be observed, and then an observation is conducted on a suspected individual in that order. The first measurement brings him say to one of 20,000, the second reduces this say to 500, the third brings him to one of fifty, and the fourth or fifth to one of some two or three. He is thus either one of these two or three, and their histories are known, or he is a fresh individual, and his records are kept for future reference. It is obvious that great care is required in making the measurements, and an enormous amount of clerical work required in keeping the

registers, but probably not more than in taking photographs, a very unsatisfactory method, nor than in taking finger impressions (*vide* next section).

For a full account of details the reader is referred to Bertillon's own writings.

15. **Galton's Thumb-marks.** — This is a similar method in principle to Bertillon's. It is thus carried out: The palmar surface of one thumb is pressed upon a paper which has been smeared with printer's ink. (In actual criminal practice it matters not whether the thumb itself or the surface on which it was pressed was dirty so long as a mark is left on some surface capable of holding an impression; the printer's ink, too, is merely the most suitable smearing surface.) There is thus produced on the surface of the paper an impression marked by very numerous fine lines, running apparently in all directions. To the ordinary eye this seems a mere confusion of lines, but Mr. Galton, studying them with great care with a lens, concluded—(1) that they ran in certain directions which could be mapped out; (2) that these directions were *constant and invariable for the same individual;* (3) that no two separate individuals' marks *exactly* corresponded. Proceeding then from the most obvious lines to the less obvious and smaller ones, he hoped by a similar procedure to that of the Bertillon system to be able to thus identify any given individual with one whose lines were known. The method is very ingenious, and has come considerably into favour with the police. Thus in December, 1903, two thieves were punished for taking part in a jewel robbery, although no part of the plunder was traced to them, by means of finger impressions on a skylight which they had unconsciously handled during their operations. It has no further medical interest.

16. **Stains, etc., on Person or Clothes.**—So far as mere identity is concerned, this subject is of somewhat slight interest, and may soon be disposed of, but inasmuch as these stains of or on the person may be points of the very highest possible importance in other connections of guilt or innocence, the whole subject must be dealt with at once in all its relationships, though it will for the time lead us far afield.

We may first consider stains or marks *on* the body. It may be at once stated that if they cannot be removed by a little plain water and clean lint or rag, they are not blood. Blood, however old on the skin, will always wash off in water. If they are not blood, they cease to have very much interest for a medical man, though a detective may yet learn much from them. The tar on the hand of a sailor or other workman, the tobacco stain on the fingers or moustache of the cigarette-smoker, the walnut juice on a street fruit hawker's fingers, constitute a few examples for consideration. A detective, with his peculiar knowledge of occupations, could supply many more.

When we turn to stains on the clothes the matter assumes at once a very complicated and important character. The splashes of paint on the clothes of house decorators or painters may have to be differentiated from bloodstains, and on the greasy clothes of a butcher or the filthy undergarments of a low prostitute may be found a stain the correct analysis of which may be the only means of proving innocence or detecting guilt. The point that will here be fully dealt with is the testing of

a given stain to determine its nature, in other words, the identification of the stain ; the deductions to be made from the analytical result are better dealt with in other connections.

The following tabulated outline of the matter will conduce to clearness of argument and facilitate reference.

1. Preliminary examination of stains :—
 - (*a*) By photography.
 - (*b*) By the naked eye or simple lens.
 - (*c*) Methods of obtaining material for further examination.
2. The methods of examination of material thus obtained :—
 - (*a*) Chemical.
 - (*b*) Microscopical.
 - (*c*) Spectroscopical.
3. How far can an answer be given to the questions—
 - (1) Is this blood?
 - (2) Is it human blood?
 - (3) How old is it?
 - (4) Is it arterial or venous? Is it menstrual blood or that of man, woman, or child?
 - (5) Did it come from a living or dead body?
 - (6) Did it come from victim or assailant?

PRELIMINARY EXAMINATION OF STAINS.

It may appear at first sight an easy matter to say whether certain suspected spots or stains on articles of clothing, furniture, or weapons are or are not owing to blood ; but in practice great difficulty is often experienced in answering the question. If the stains are large and recent, most persons may be competent to form an opinion ; but the physical characters of blood are soon changed, even when the stuff is white and otherwise favourable for an examination. If the stains, whether recent or of old standing, are upon dark-dyed woollen stuffs, as blue, black, or brown cloth, or if they appear in the form of small or detached spots, or in thin films on dark clothing or rusty weapons, no one but a competent medical man should be allowed to give an opinion.

(*a*) *By photography.*—There may be very material advantage in photographing bloodstains in their natural state, and in any case there cannot be any disadvantage in possessing thus an exact representation of the way in which the blood was scattered about.

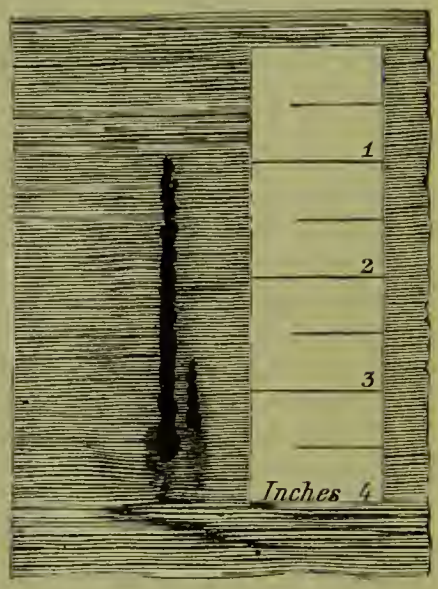
In the case of Raynor (*Reg.* v. *Watson and Wife*, Notts Lent. Ass., 1867), the position of certain splashes of blood on the flap of a kitchen-table was of some importance in the case. The engraving (fig. 1) is from a photograph, taken to a scale of inches, showing the relative position and length of two streaks of blood. A photograph thus made will give a better idea of quantity and position than any verbal description.

(*b*) *By the naked eye or simple lens.*—The colour is thus observable, and if due to blood, will be either red or brownish red through darker shades to a colour nearly black, the colour depending on age and other circumstances (*vide* "Spectroscopic Tests").

If, moreover, the stain is caused by blood, it will not be a mere

colouring of the fibres, but it will have a shining glossy appearance, and each fibre will be observed to be invested with a portion of dried coagulum or clot. In other cases, minute coagula or clots presenting the appearance of dried jelly will be seen in the meshes of the stained article of clothing. In certain lights the clots may appear of a dark red colour, but by changing the light bright translucent portions of a peculiar crimson tint will come into view. The crimson colour of a bloodstain is unlike that of any other red colouring matter, and when the stained portion presents the character of a dry coagulum, the stain cannot be easily mistaken by a practised eye for that caused by any other red colour. In fact, a lens puts the observer of a small stain in the same position as a non-professional person, who unhesitatingly forms his judgment from a large quantity of dried blood. Portions of kino over a dress may present occasionally the appearance of coagulated blood; but kino differs in colour and in chemical properties from blood. Small fragments of crushed fruit or jam may also cause a somewhat similar appearance, but these will easily be detected later on in the analysis. This preliminary observation of a suspected stain on linen, cotton, or woollen, however small, is generally sufficient to enable an expert to form an opinion either in the affirmative or negative; but for all that he must never omit, in such an important matter, to apply *all* the tests for blood. When the stain is on black or dark-coloured cloth, no colour will be visible. If owing to blood, the fibre will, however, be stiffened, and when viewed by reflected light it may appear glossy, owing to the drying of the albumen or serum.

Fig. 1.



Stains of blood on the flap of a table. Case of Raynor, *Reg.* v. *Watson and Wife* (Notts Lent Ass., 1867).

(*c*) *Methods of obtaining Material for Further Analysis.*—These all depend upon the fact that the red colouring matter of blood is more or less soluble in water; when quite fresh, and therefore in the condition of hæmoglobin, either oxidised or reduced, it is very easily soluble in cold water; when it is older, and consequently contains a considerable proportion of methæmoglobin or of hæmatin, its solubility in plain water is proportionately diminished; and if it be entirely converted into hæmatin, and perhaps even into iron-free hæmatin, it requires menstrua with greater dissolving power. These varieties of colouring matter will receive more notice when the spectroscopical properties of blood are under discussion. Several menstrua have been suggested and used for dissolving more obstinate bloodstains. Amongst the simplest, and therefore the best, of these are (*a*) a saturated solution of borax in distilled water; (*b*) a 10 per cent. solution of glycerine in distilled water; (*c*) a weak solution of ammonia, the ordinary liquor ammonia of the British Pharmacopœia serving very well. Heat has a somewhat similar action on hæmoglobin to that which age exerts, breaking

it up into hæmatin and globulin. In the case of a dead body found burnt, or pieces of charred furniture and similar articles which have been exposed to considerable heat, but with stains on them resembling those of blood, due allowance must be made for this change by prolonging the efforts at obtaining a solution in water or by using one of the other menstrua, of which the ammonia will be found most efficacious.

Whatever be the material then which is submitted to an expert for examination, the same method of procedure must, in the first instance, be adopted, viz., to place the suspected material in a small quantity of one or more of the above solutions. If no coloured solution is obtained at once, the vessel in which the investigation is going on must be carefully protected from dust and left for from twelve to twenty-four hours. It is practically certain that if blood be present there will by this time have appeared a red or reddish brown coloration in the liquid, or if minimal quantities are being dealt with, that it will be possible with a glass rod to squeeze out into a glass slide a drop or two of a similarly coloured fluid. If after this length of time no coloration has appeared in the fluid this is strong presumptive evidence that the stain is not blood, but for all that several other tests must be applied before accepting this conclusion, for the negative may be just as important as the positive, since it may tend to remove unjust suspicions from accused persons. Oil or grease in a stain interferes considerably with the solubility of bloodstains, and if this is present the stain may be first brushed over with a little ether, in which oils and fats are readily soluble. From a metal weapon a piece of coagulum or a suspected spot of rust or other stain must be scraped off and treated as above; if the film is too thin to be seen with the naked eye, or if the weapon looks quite clean but is suspected to have blood on it, we should then pour a thin stratum of water on a piece of plate-glass, and lay the stained part of the weapon upon the surface. The water slowly dissolves the colouring matter of blood, and the coloured liquid may be examined by chemical processes. If the weapon has been exposed to heat, so as to destroy the blood pigment, this mode of testing will fail. The dilute solution of ammonia may be advantageously used for the solution of bloodstains on iron.

Luckily for the ends of justice, the criminal classes are very ignorant of the best methods of removing blood completely from an article; nevertheless it is possible that the above procedure may be rendered futile, for an attempt may have been made to wash out bloodstains, so that the colour may be more or less changed, and no chemical evidence obtainable. There is a common notion that certain chemical agents will remove or destroy these stains, but this is not the case; the colour may be altered, but when dried on the stuff it is not easily discharged nor bleached. Chlorine, a most powerful decolorising agent, turns the colouring matter of blood to a green-brown colour. Nothing removes a bloodstain, whether wet or dry, so effectually as simple maceration in *cold* water, or in a saturated solution of borax, although, when the stain is old, the process is slow. *Washed stains* may now be readily detected by means of guaiacum (*vide* below), provided any red tint remains, and they are on a colourless article of clothing. A drop of the tincture is poured on the stuff, and if there

is no change of colour, peroxide of hydrogen in ether is added. The blue colour appears immediately, and becomes more intense by the evaporation of the ether or on the addition of alcohol to dissolve the white resin. In *Reg.* v. *Baker*, a case involving a charge of murder and the mutilation of a girl (Hants Aut. Ass., 1867), the trousers of the prisoner sent for examination had been stained with blood in front. An attempt had been made to remove these stains by soaking them in water. This had carried the red colouring matter into the calico lining, and had given to some patches a strong and to others a pale reddish tint. The direct application of tincture of guaiacum and peroxide of hydrogen indicated blood over a square foot of the calico lining, and beyond this these liquids produced no change. The degree of the diffusion of the blood, as it had been washed from the front of the trousers into the lining, was thus clearly defined.

On a trial for murder (*Reg.* v. *Misters*, Shrewsbury Lent Ass., 1841) this question as to the power of certain chemical reagents to remove stains of blood was raised. Alum was traced to the possession of the prisoner; it was found dissolved in a vessel in his bedroom, and it was supposed that he had removed the bloodstains from his shirt by the use of this salt. Two medical witnesses deposed that they had made experiments, and had found that alum would take the stains of blood out of linen, according to one sooner than soap and water. The result of the author's experiments did not correspond with these. It was not found that alum removes stains of blood so readily as common water; and when alum is added to a solution of blood pigment in water, so far from the colour being discharged, it is slowly converted to a deep greenish brown liquid. In one experiment a slip of linen, having upon it a stain of dried blood of old standing, was left in a solution of alum for twenty-four hours, but not a particle of the red colouring matter had been extracted, although it was changed in colour. The effect of the alkali contained in yellow soap, as well as of potash, soda, and their carbonates, is to change the red colour of blood to a deep greenish brown, but they do not exert on it any discharging or bleaching power. Combined with friction, fresh bloodstains may, of course, be easily effaced by any *cold* alkaline or soapy liquid.

TESTS FOR BLOOD.

A. Chemical.

The above process for obtaining a solution of the red colouring matter of blood is really the first chemical test for blood, viz.:—

(1) It is soluble in cold distilled water, forming a solution which is bright red if the blood be recent, but a brownish red when older stains are being examined.

(2) The red colour of this solution is not changed to a crimson, blue, or green tint by a few drops of a weak solution of ammonia. If the ammonia is strong or added in large quantity the red liquid will acquire a brownish tint, but the smaller amount of ammonia will cause no perceptible change in the solution.

(3) If a further portion of the red solution be heated to about 170° F. it will be found, if the solution be one derived from blood, that

the colour will be entirely destroyed, and a muddy-brown flocculent precipitate will be formed, which can be again dissolved in ammonia water, giving a dichroic liquid green by reflected, red by transmitted, light. The explanation of this test depends upon the fact that hæmoglobin or methæmoglobin contains a large portion of an albuminous compound, globulin, which is coagulable by heat and in its coagulation carries down with it the coloured non-albuminous portion, the hæmatin. Hence the amount of the precipitate varies with the depth of the colour in the original solution.

(4) The Guaiacum test. If to a little of the red solution of blood colouring matter a few drops of alcoholic solution of guaiacum resin—the tinct. guaiaci of the British Pharmacopœia is a very convenient preparation for the purpose—be added, a dirty reddish white precipitate is formed. To the muddy liquid thus formed a little ozonic ether or solution of peroxide of hydrogen must be added, when the mixture will assume more or less rapidly a beautiful deep blue colour, or if ozonic ether has been used the ether which floats on the mixture or rapidly rises to the surface after thorough mixing is seen to possess this beautiful blue colour. This test may be applied in a somewhat different manner, as follows :—The suspected spot is first thoroughly moistened with just sufficient water for the purpose. Tincture of guaiacum in similar sufficient quantity is next poured on, and then the peroxide of hydrogen. If the material is such as to allow colours to be seen the blue colour will be seen at the edges of the stain; if the material be black or otherwise unsuitable for exhibiting the colour, then alternatively, when the spot has been moistened with the water only, a piece of white blotting or filter paper may be pressed upon it, and the stain (if soluble in the water) thus transferred to the white material, when the subsequent addition of the guaiacum and peroxide will develop the blue colour at the edges at least, and possibly all over. This method, when performed with merely damp, not wet, material, will aid a photographic representation of a bloodstain by making a blue mark on the paper of approximately the same size and shape as the original.

B. Microscopical.

Attention has already been drawn to the examination of a suspected stain with a lens with the object of discovering small coagula of fibrin on the meshes of a dress material or the surface of non-absorbent stuff, such as stone. The further microscopical tests for blood consist in the discovery of two substances : (1) The red corpuscles of the blood; (2) Crystals of hæmin, or hydrochlorate of hæmatin. In both cases the technique is somewhat different from that used in obtaining a solution for chemical tests and requires full description.

1. **The Discovery of Corpuscles.**—There are only two conditions under which it is possible to even hope to find the corpuscles of the blood for microscopical examination :—First, that the stain shall be quite fresh, *i.e.*, not at the outside more than twenty-four hours old; and (or) second, that a small fragment of clot shall be available for experiment. The obstacles in the way of the examination are, firstly, that when once the corpuscles have dried (and in the dried state they are utterly unrecognisable by mere microscopic observation), it is only

with extreme difficulty that they can be induced to return to their normal size and shape; they will absorb water indeed rapidly and easily enough, but in the process burst and become totally unrecognisable. To avoid excess of water, Dr. Taylor suggested the following as the best plan of proceeding when the particles of coagulum are very small, viz., to breathe several times on a glass slide, then place the small fragments of coagulum on the slide, and again breathe over them. A slip of thin glass may then be laid upon them. If they consist of blood a red margin will soon appear, and in the fluid portion, by the aid of a magnifying power of from 300 to 500 diameters, some of the corpuscles of the blood may be recognised. They are seldom so perfectly spherical as in the fresh state, and they appear small, and frequently shrunk or corrugated. In some cases only fragments of the envelopes can be seen. The condensed moisture of the breath serves the purpose of water in breaking up the particles of dried blood, without destroying the corpuscles by too much dilution. The red colour of blood is well brought out under these circumstances.

If the suspected clot is in larger quantity, it may be removed from

Fig. 2.



Blood-crystals.

Fig. 3.



Blood-crystals.

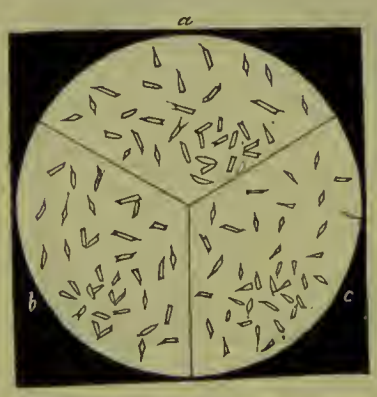
the stuff and macerated in one or two drops of water on a glass slide. It should be covered with thin glass, in order to prevent rapid evaporation. This method of extracting the corpuscles has frequently failed, owing to the quantity of water employed having been too large, and unless the corpuscles are observed almost at once, they will probably not be seen at all. To accelerate the procedure and therefore to give a better chance of detection of the corpuscles, the artificial media mentioned under the chemical tests have been employed as well as serum itself, and normal saline solution. These have not such a rapidly destructive action on the corpuscles as has plain water.

Lesueur and Robin have adopted the following plan, which they affirm to be successful for the detection of mammalian blood. A portion of the suspected coagulum is scraped off the stained substance into a solution of sulphate of sodium, made slightly alkaline by the addition of a little caustic soda, and it is then examined under the microscope, with a power of 520 diameters. At first the substance appears entirely homogeneous, but in half-an-hour it swells, and in another half-hour globules are formed, which can be separated by gently rubbing the glass slides one upon the other. These observers

thus identified red corpuscles as those of mammalian blood (*Chem. News*, 1850, 2, 295).

2. **The Production and Discovery of Hæmoglobin and Hæmin-crystals.**—Lehmann and Kunze ascertained that all red blood is capable of crystallisation or of breaking up into crystalline forms, from whatever animal or organ it may have been taken. A drop of blood is allowed to evaporate on a glass slide; a drop of distilled water is then added, and the whole is covered with a slip of thin glass. After a time, when the water has to some extent evaporated, regular red-coloured crystals, of various sizes and forms, such as those represented in the quadrant *a* of fig. 2, are visible. Some are columnar and prismatic, while others are in the form of rhombic plates. The second quadrant, *b*, represents the crystals procured, by a similar process, from the heart-blood of a cat. The third, *c*, crystals from the venous blood of a guinea-pig, which appear in regular tetrahedra; and the fourth, *d*, crystals from the venous blood of a squirrel; some of which are prismatic, and others in the form of rhombic and hexahedral

Fig. 4.



Hæmin-crystals, magnified 517 diameters.

Fig. 5.



Hæmin-crystals, as obtained from human blood (Neumann).

plates. The crystals are represented in this and the other engravings as transparent. They are, in fact, translucent, and under a good light, of a well-marked red or red-brown colour.

In fig. 3 the first quadrant, *a*, shows the prisms and rhombic plates obtained by Lehmann from human venous blood; *b*, blood-crystals from human blood in rhombic plates, as delineated by Robin and Verdeil ("Chimie Anatomique"); and *c*, crystals obtained from human blood, by Kunze, by a process described below. Some of these have a rhombic form; others are shaped like a hempseed; and a few, being double at one extremity, have the appearance of a swallow's tail. In the quadrant *d* are represented crystals as obtained by Lehmann from the red blood of a fish. It is to be observed of these crystals that they are all coloured, having more or less the red colour of the blood.

The coloured crystals obtained by this method would appear to consist of, or at all events contain, hæmoglobin, in an almost unaltered condition; if the blood be older, or if it have been once really dried, the method of obtaining crystals is slightly different and the crystals when

obtained consist of a chloride of hæmatin without any admixture of a proteid constituent.

The method is as follows :—A small fragment of clot, or a bit of the suspected material is placed upon an ordinary microscope slide ; a few drops of glacial acetic acid are then added, and the acid and material thoroughly incorporated by means of a glass rod. The dirty-looking fluid (the material from which this was obtained may be removed) thus obtained has then added to it the smallest possible fragment of common salt ; a thin cover slip is then placed on the top of the fluid and the slide is waved to and fro over a Bunsen flame till active ebullition occurs (some little care and dexterity is required for this little operation, or the slide may be shattered by the heat or the cover slip blown away) ; the slide with its contents is then allowed to cool. The residue is examined by a microscopical power of 300 to 500 diameters. The hæmin-crystals, if present, appear in groups, as small dark specks. They are somewhat irregular in shape—have generally a prismatic form, some with rhombic terminations, while others assume a spindle shape ; and others again are joined at an angle, so as to resemble a bird's tail, or they cross each other like the letter X. Hæmin-crystals, from human blood, were found to have an average length of 1-2250th of an inch, and a width of 1-9000th of an inch. Those obtained from sheep's blood were smaller than those obtained from the blood of man and of the bullock. A fragment of dried bullock's blood which had been on a rag for about six years, gave, when similarly treated, the group of red-coloured crystals seen in *b*, fig. 4 : and blood of the sheep, of old date, gave the form seen in *c*.

Gwosdew adopts another method, which embraces the use of the spectroscope, as well as the production of crystals. The dry clot is treated with alcohol and carbonate of potassium. The red colour is extracted, and this gives a single band in the spectroscope between *C* and *D* on the spectrum. The colouring matter is thrown down by dilution with water and the addition of acetic acid. To procure crystals the precipitate is dried, mixed with common salt and glacial acetic acid, and evaporated at 212° F. (" Ueber die Darstellung der Hämin," 1866). By Gwosdew's method three distinct processes for the detection of blood may be thus applied to the colouring matter extracted from a small stain. The colouring matter of blood so treated may be converted into quasi-crystalline forms, still preserving its red colour ; and microscopical evidence of blood may be thus obtained, in cases in which the blood-corpuscles have not been successfully extracted by liquids. A very small quantity of dry coagulum will suffice to yield this corroborative evidence.

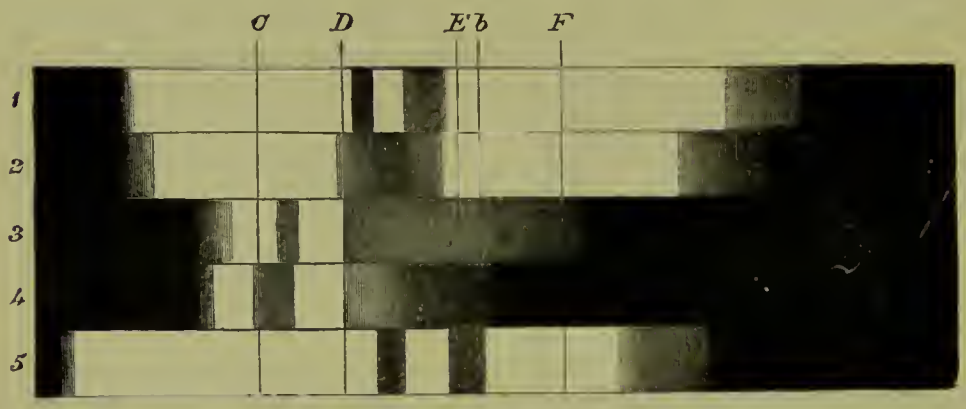
For further information on the subject of bloodstains, the reader is referred to the following works :—" Blutkrystalle Untersuchungen," von W. Preyer, Jena, 1871; Neumann, "Erkennung des Blutes," Leipzig, 1869 ; *Chemical News*, 1868, p. 124 ; *Lond. Med. Rec.*, 1882, p. 83 ; and *Pharm. Jour.*, 14, p. 274, and works on Physiology.

C. Spectroscopical Tests for Blood.

Spectrum Analysis—Spectral Test.—The great advantage of this optical process is that it admits of the examination of blood without

in any way interfering with the subsequent application of the chemical tests already described. We simply analyse the light as it traverses a solution of the red colouring matter, and with a spectroscope attached to a microscope we notice whether the coloured spectrum has undergone any change. If the red liquid owes its colour to recent or oxidised blood, two dark absorption-bands will be seen breaking the continuity of the coloured spectrum (No. 1, fig. 6). These are situated between the *D* and *E* lines of the solar spectrum. The less refrangible of the two bands is the sharper and better defined of the two. Yet if the blood is quite recent and of a bright red colour (oxyhæmoglobin) the two absorption-bands are both distinct and well defined. A good light—either artificial or daylight—is required; the coloured liquid should be clear and of sufficient intensity, and the spectrum apparatus properly adjusted. The blood may be placed in a narrow glass tube, or in a glass cell contrived for the purpose. The spectroscope should allow

Fig. 6.



1. Spectrum of oxyhæmoglobin.
2. Spectrum of hæmoglobin (reduced hæmoglobin).
3. Spectrum of methæmoglobin.
4. Spectrum of blood with acetic acid (acid hæmatin).
5. Spectrum of hæmochromogen (reduced hæmatin).

(*Drawn to a scale of wave-lengths.*)

of two tubes being examined at once, and it is desirable to have a specimen of blood mounted for comparing the actual spectrum of blood with that of the suspected liquid.

In the course of an hour, in warm weather, and after a day or two in cold weather, the blood in the tube undergoes a change. It loses its scarlet and acquires a purple colour (hæmoglobin or reduced hæmoglobin). In this state the two bands appear blended, and one broad black band only is seen (No. 2, fig. 6). The blood undergoes deoxidation, for on removing it and shaking it with air in the tube, it becomes again bright, and the two bands reappear. The same change from a two-banded to a one-banded spectrum is effected by the addition of an ammoniacal solution of ferrous tartrate (Stokes's solution). This solution is made by dissolving a fragment of ferrous sulphate in water, adding an excess of tartrate of potassium, and then enough of a dilute solution of ammonia to dissolve any precipitate which may have formed. The solution must be freshly prepared for use.

When a solution containing blood is exposed to the air for some time it loses its blood-red colour, and assumes a brownish tint. If it

be now examined by the spectroscope it will be found that a new absorption-band has made its appearance between the *C* and *D* solar lines; but somewhat nearer to *C* than to *D* (No. 3, fig. 6). This is the band of so-called methæmoglobin.

If a solution containing hæmoglobin is acidified with acetic acid, the pigment is destroyed, the solution acquires the brown-red hue of an old bloodstain, and hæmatin is formed. The same change is effected by prolonged exposure of blood to air. Hæmatin in acid solution affords a spectrum the number of bands in which varies according to the solvent employed. Its acid solution in water has a very marked absorption-band, as depicted (No. 4, fig. 6) extending from about midway between the *C* and *D* solar lines up to *C* at the red end of the spectrum. If the solution be now made alkaline with dilute ammonia, the band shifts towards the blue end of the spectrum: it is indistinct and just touches the *D* line at its most refrangible border. The addition of Stokes's solution, or of other alkaline reducing agent, now results in the production of the two magnificent bands (No. 5, fig. 6) of hæmochromogen (reduced hæmatin). These are more refrangible than those of oxyhæmoglobin with which they might possibly be confounded, the broader and more refrangible band extending beyond the *F* line towards the blue; and the narrower band is already deep and sharply outlined before a concentration is reached which reveals the more refrangible band.

A bloodstain, however minute, may, if more or less recent, be made to yield successively all the spectra depicted in fig. 6; but old bloodstains which have become insoluble may yield the spectra only of hæmatin and of the so-called reduced hæmatin (hæmochromogen). The stain is macerated in water or in a saturated solution of borax; and the reddish solution thus obtained is examined spectroscopically side by side with a drop of fresh blood diffused through water. Spectroscopes proper for the purpose are provided with an arrangement for comparing the two spectra side by side; and the coincidence of the absorption-bands under examination with those of blood can be ascertained. A drop of ammonio-ferrous sulphate solution (Stokes's) is then added to the two liquids; and in the event of blood being present, the one-banded spectrum of hæmoglobin (reduced hæmoglobin) can be compared with that produced from the liquid which is known to contain blood. The original solution may now be precipitated with a 5 per cent. solution of acetate of zinc, and the reddish precipitate containing the blood-pigment slightly washed on a filter with water, and redissolved whilst still moist in a few drops of glacial acetic acid. This solution will afford the spectrum of acid hæmatin (No. 4, fig. 6). Old bloodstains may be at once boiled with glacial acetic acid, or dissolved in a cold solution of tartaric acid or in dilute ammonia. The hæmatin solution when treated with ammoniacal ferrous sulphate exhibits the two-banded spectrum of reduced hæmatin (hæmochromogen) (see No. 5, fig. 6).

Having thus given an outline of the tests to which blood will react, we have now to critically examine them and see how far they will answer the questions demanded by the law, and remembering that law demands rigorous proof, not probability. The law of multiple evidence is here again very much to the front.

1. Is this Stain Blood.

The preliminary examination with the naked eye and a lens commences the process of differentiation thus:—Iron-mould stains and stains from cochineal, and the red colours of wine, flowers, and fruit, do not cause any stiffening of the fibre of the stained stuff, nor any appearance under the lens at all resembling a direct coagulum of blood; and, again, of the various red colouring matters extracted from vegetable and animal substances, there are none which, to the experienced eye, present in a stain on any fabric the peculiar crimson-red tint of dry blood, especially when the substance is examined in a good light.

In the next step of examination, viz., that of obtaining a solution for examination, we know that blood in all stages is soluble in one of our menstrua, hence if the stains are quite insoluble in any of these we have a further presumption that the stain is not blood, such insoluble stains may frequently be detected by their special characters, thus:—*Iron-moulds* are of a reddish-brown colour, sometimes of a light or orange-red. They are quite insoluble in water, but are easily dissolved by diluted hydrochloric acid, and on adding ferrocyanide of potassium to the hydrochloric solution, the presence of iron will be at once apparent. Care should be taken that the acid used for this purpose contains no iron. A more satisfactory method of testing is to apply to the spot glacial acetic acid, followed in a few minutes by a solution of tannic acid. A bluish purple stain of ink is produced, thus indicating that the spot is owing to oxide of iron. Tannic acid alone has no action on iron-moulds. Notwithstanding these well-marked distinctions, mistakes are sometimes made, as in the following case. Some years since a man was found drowned in the Seine at Paris, under suspicious circumstances. The body had evidently lain a long time in the water. On examining the shirt of the deceased, a number of red-brown stains were observed on the collar and body—resulting, as it was supposed, from spots of blood, which had become changed by time. On a chemical examination, however, they were found to be iron-moulds, produced by the rusting of a steel chain which the deceased had worn round his neck. *Red paint.* Stains made with red paint containing ferric oxide have been mistaken for blood. They may be easily known by digesting them in diluted hydrochloric acid, and applying to the solution the tests for iron. Like those produced by iron-moulds, they are insoluble in water, and therefore cannot be confounded with ordinary bloodstains. The same may be said of spots of the ammonio-nitrate of silver changed by light, which the author has nevertheless known to be mistaken for old stains of blood. The stuff on which the spots of blood are found may be itself stained with a fixed red dye or colour, madder when mordanted is thus quite insoluble, and a cochineal stain may give no colour to water; or it may be dyed with iron: in this case it will be necessary to test by the same process pieces of the coloured and stained portions, in order to furnish evidence that the suspected stains are due to blood. In *Spicer's Case* (*ante*), an apron which the prisoner wore was found with stains of blood upon it; but the greater part was covered with dark red stains, which turned out to be owing to a logwood-dye that the prisoner had used in his business (*Med. Gaz.*, vol. 37, p. 613).

In the case of Mr. Briggs (*Reg.* v. *Müller*, C. C. C., October, 1864),

a question arose whether there was dried coagulated blood upon a life-preserver, which the prisoner might have employed. The weapon consisted of a heavy mass of lead, enclosed in a network of string, and secured to a whalebone handle. There was a substance on the network resembling dried blood. When this was removed and placed in contact with water, it was not dissolved, and, under the microscope, presented the appearance of brown flakes, which gave no colour to the surrounding liquid. On applying a red-hot platinum wire to the supposed coagulum, it melted, and gave off the smell of resin. It was part of a resinous composition which had been used for securing the lead to the network; it had become softened by heat, and had oozed out between the meshes. No blood could be detected in any part.

Supposing, however, that we have thus obtained a solution so that a fluid with some resemblance to the colour of blood is submitted for examination, the chemical tests offer very considerable evidence of a definite nature. Among such soluble stains and solutions are those produced by the juices of fruits, currants, gooseberries, plums, etc., solutions of cochineal and other red inks. When solutions of these red colouring matters are treated with ammonia, some—such as cochineal, logwood, and the colours of roots and woods—acquire a deep crimson tint; while others, such as the red colours of flowers and fruits, are changed to a blue or green. These red colours are not destroyed by a boiling temperature, and even when mixed with albumen this is coagulated, but the red colouring matter remains unchanged. In the case of blood, the effect of heat is to destroy the colour entirely, but the treatment with ammonia simply, without the heat, merely turns a solution of blood somewhat browner or has no effect upon it at all. [This same colour test with ammonia is applicable to a stain *in situ*.]

In applying the guaiacum test to small quantities of the above it is found that they give a reddish colour to the resin of the tincture of guaiacum, but undergo no change on the addition of peroxide of hydrogen. They are thus well marked and distinguished from blood. Whether the blood is new or old, whether concentrated or exceedingly diluted, the test produces the blue coloration. It produces the change better in a diluted than in a concentrated state. A drop of blood diffused through six ounces of water may be thus detected in one or two drachms of the mixture. This test is therefore the most delicate of the chemical ones for asserting the presence of blood, but it is still more useful in proving the *absence* of blood. If the blue coloration appears either at once (as is usual when blood is not present) on the addition of the guaiacum, or even when the test is fully positive, caution must be used in asserting that it is to blood that the change is due, for it has been ascertained that some of the domestic vegetables, especially horseradish, will produce the blue colour. There will be, however, two points of difference which with care will lead to right conclusions—one, above noted, that the colour appears on the addition of the guaiacum alone, and the second that the original solution will not have any reddish colour suggestive of blood.

In previous editions of this work, Dr. Taylor offered the following criticisms on this test. They are as true to-day as when they were first written, and may very well be retained:—

Although several substances have the property of bluing guaiacum,

or of rendering a mixture of guaiacum and peroxide of hydrogen blue, there are few cases occurring in actual practice where the test is not available, and of considerable probative value. The tincture of guaiacum employed should be diluted, freshly prepared, and made by dissolving a fragment taken from the centre of a lump of the resin, in rectified spirit of wine. The tincture should be first added to the liquid to be tested. If a blue colour be produced, as will be the case should a ferric salt, or many other substances, be present, the test cannot be applied; but if no blue colour results from the addition of the tincture a small quantity of a solution of peroxide of hydrogen should be added. At once, or in the course of a few seconds if a trace only of blood-pigment be present, a perceptible blueness of the liquid will be observed, which becomes more manifest if enough rectified spirit be added to redissolve the precipitated resin. Some experimenters prefer to use the ethereal solution of the peroxide known as ozonic ether; whilst others, again, prefer oil of turpentine which has been freely exposed to the air. If either of these two liquids be employed in place of the aqueous solution of the peroxide, they will rise to the surface of the liquid, carrying with them most of the blue compound. Whatever oxidising agent be employed—the aqueous or the ethereal solution of peroxide of hydrogen, or oil of turpentine—its fitness for testing must be determined by adding to it a small quantity of bichromate of potassium strongly acidulated with dilute sulphuric acid, when a rich blue colour should be produced if the test liquid is fit for use.

Lefort has objected to this process on the ground that the resin of guaiacum is blued by an "unlimited" number of substances ("Ann. d'Hyg.," 1870, 2, 432); but this objection is irrelevant and misleading. Schönbein and Day have both proved clearly that the colouring matter of blood does not cause a bluing of guaiacum resin, and therefore it could not possibly be mistaken for any one of the "unlimited" number of substances, having nothing in common with blood, which change the colour of this resin. It is always advisable in practice to add the guaiacum first. If this is blued, then other methods of detecting blood should be resorted to.

Lefort, in dealing with this subject, forgets that in medico-legal researches the problem is to distinguish the *red* colouring matter of blood from other *red* colouring matters. He thinks that *colourless* saliva and colourless mucus may be mistaken for blood, because, according to him, they are turned blue by the guaiacum and peroxide, like blood. Assuming that he is correct (although his results are not in accordance with the author's experiments), no medical jurist could mistake colourless stains of these liquids for stains of *red* blood.

The same remarks apply to the colouring matter of bile, which, according to Jamieson (*Austral. Med. Jour.*, October, 1869), produces slowly a bluing of the guaiacum resin in contact with peroxide of hydrogen. In practice, stains of bile are so strongly marked by their peculiar yellow colour and special tests, that no one competent to undertake such investigations could fall into an error of confounding them with stains of blood. The mistakes which have arisen respecting blood on clothes have been chiefly traceable to the presence of stains derived from red fruits and flowers, artificial red dyes, and some red

mineral substances, such as ferric oxide. Lefort states that stains produced by the red colouring matter of wine gave a blue colour on the addition of a mixture of guaiacum and peroxide, but this was only after *some hours' exposure* (*op. cit.*, p. 438). It is the very essence of this mode of testing, that the effect in blood is immediate, or that it takes place within a few seconds. No reliance can or ought to be placed upon any change of colour which requires hours for its production, since the resin alone, or in mixture with peroxide, is slowly blued under long exposure to air.

The test operates equally well on fresh and old blood, and on concentrated as well as very diluted blood, even on blood which has been boiled. In conjunction with the spectroscope, it is the only certain method of discovering washed blood. Provided some small portion of red colouring matter remains, the change to blue is perceptible. If the stain on the material gives no indication of a red colour, or the spectroscopic test—whatever might be the effect of this or any other tests—it would be unsafe to affirm that blood was present. On the other hand, the proper precautions being observed in the use of this test, if there is no bluing of the guaiacum resin in the presence of the peroxide, it will be safe to say that the mark or stain is *not* owing to blood. Every prudent witness would avoid relying upon one test, and therefore, as so small a quantity of blood is required for the action of guaiacum, it will be always easy to reserve a portion for the spectroscope and chemical tests, so that no objection could be fairly raised against the results.

There is often a remarkable resemblance to the stains of blood on metal, produced by the *oxides or certain salts of iron with vegetable acids*. If the juice or pulp of lemon or orange is spread upon a steel blade, and is exposed to the air for a few days, the resemblance to blood produced by the formation of *citrate of iron* is occasionally so strong that well-informed surgeons have been completely deceived: they have pronounced the spurious stain to be blood, while the real bloodstain on a similar weapon was pronounced to be artificial. The difficulty of distinguishing such stains by the eye is illustrated by the following case which occurred in Paris. A man was accused of having murdered his uncle. A knife was found in his possession, having upon it dark-coloured stains, pronounced by those who saw them to be stains of blood. Barruel and another medical jurist were required to determine the nature of the stains, and the examination was made before a magistrate in the presence of the accused. They were clearly proved, by these and other experiments, to be spots produced by the citrate of iron. It appeared on inquiry that the knife had been used by some person, a short time previously, for the purpose of cutting a lemon; and not having been wiped before it was put aside, chemical action had gone on between the acid and the metal which had given rise to the appearance. This case certainly shows that physical characters alone cannot be trusted in the examination of these suspected stains. Stains of the *citrate of iron* may be thus distinguished:—The substance is soluble in water, forming, when filtered, a yellowish solution, different from the red colour of blood under the same circumstances. The solution undergoes no change of colour on the addition of ammonia. If in the state of persalt, it is rendered blue by tincture

of guaiacum alone. It is unchanged in colour, but may be partially precipitated at a boiling temperature, and it is at once identified as a ferric salt by giving a blue colour with the potassium ferrocyanide. Spots of the citrate of iron on knives are often soft and deliquescent, while those of blood are commonly dry and brittle.

Again, in old bloodstains on rusty weapons, the rust, the blood, and perhaps some old article of food, are all mixed up together, and they require to be separated; water, or, better still, ammonia solution, will in time do this so far as the blood is concerned, and the coloured fluid thus obtained may be tested with any of the tests mentioned. If sufficient material is present to allow of filtration of the liquid resulting from maceration, this may be done. If the stain is due to iron-rust alone, this will be separated by filtration, and the liquid will pass through colourless. If we now digest the brown undissolved residue left on the filter in hydrochloric acid, free from iron, we shall obtain a yellowish solution, which will give with ferrocyanide of potassium a blue colour—Prussian blue. By this process, blood was readily detected on a rusty knife used in an act of murder committed ten years previously (*Case of Gardner*), although no blood could be seen on the blade with the aid of a lens.

A man was suspected of murder, and on the collar and upper part of the shirt there was a large and somewhat deep pinkish-red stain, in some respects resembling washed blood. This appeared to be an unusual situation for blood to be found sprinkled; and upon testing the stained linen, the stain was thus proved not to be due to soluble blood. On inquiry, it was ascertained that the man had worn round his neck a common red handkerchief during a wet night, and while taking violent exercise. The reddish coloured stain was thus accounted for. There were, however, some other marks on the shirt which required examination, as there was a very strong suspicion against this man. These were on the sleeves, at those parts which would be likely to receive stains of blood if they had been rolled or turned up at the wrists; and it was ascertained that the murderer in this case had used a quantity of yellow soap in washing his hands. The stains were of a brownish colour, and, so far as external characters were concerned, it was difficult to say whether they had been produced by blood or not. On examining the parts of the shirt corresponding to the armpits, stains precisely similar were there seen, evidently resulting from cutaneous perspiration. Strips of linen from the stained portions of the sleeves were digested in water. In twenty-four hours the stains were entirely removed, and the water in each tube had acquired a straw-yellow colour. The solution was wholly unlike that produced by blood under any circumstances; it was not changed in colour by ammonia, or by a heat of 212° F.; but it acquired a faint opalescence on the addition of nitric acid. These results not only indicated the absence of blood, but showed that the stains were due to perspiration. The stains on the parts corresponding to the armpits could not be ascribed to blood, and from the similarity in physical and chemical properties it was impossible to attribute those on the sleeves to blood. It happened, however, that a large pocket-knife, with numerous dark-red stains on the blade and between the layers of the handle, was found upon this man. Several persons who saw the knife pronounced that the

marks were due to blood. These stains were due not to recent blood, but to a mixture of some animal matter, probably food, with iron-rust. The man was tried for the murder, and acquitted on an alibi.

As regards the corroboration of these chemical tests which the microscopical examination can offer, it may be said that if red corpuscles *are* found in sufficiently fresh and natural condition to be certainly recognised, there can be no doubt that the liquid is blood. Such evidence can, however, be safely received only from one who has been accustomed to the use of this instrument and to the examination of blood. The same remark may be made about the recognition of hæmin-crystals, with this addition, that these crystals may even under the microscope be put through the guaiacum and the spectroscopic tests for further proof that they are what they are alleged to be. Negatively there is this to be said that none of the red fluids which might be mistaken for blood owe their colour to particles in suspension in any way resembling corpuscles, and heat applied to such a solution soon shows whether the colour be due to free hæmoglobin or not.

As a final corroborative test, the spectroscope must be used in any case in which doubt may possibly be thrown on the medical evidence respecting the nature of a stain.

There can be no doubt that in the hands of a competent person, and one skilled in micro-spectral observations, this optical method will enable him to discover the minutest traces of blood, provided any red colouring matter remains. Thus Sorby states that a spot of blood only one-tenth of an inch in diameter, or a quantity of the red colouring matter amounting to no more than the 1,000th part of a grain, is sufficient to give conclusive evidence of its presence by spectrum analysis. Sorby thus detected blood on the rusty blade of a knife with which the murder of Mrs. Gardner was committed in 1862, after the lapse of ten years. Bloodstains which have been washed in water, and blood which has even been boiled or heated to 212° F., may be thus detected. In the latter case, ammonia with the aid of a gentle heat, should be employed to dissolve the matters rendered insoluble by boiling. As a corroborative process it furnishes most valuable and trustworthy evidence, and there is no case in which blood admits of a chemical examination in which spectral analysis does not admit of a safe application before the chemical tests are applied. Falk describes it as the most certain, satisfactory, and simple process for detecting blood in medico-legal cases (Horn's *Vierteljahrsschrift*, 1867, 1, 354).

The question here arises, "Are there no objections to this optical test? Are there no red colours which, when traversed by light and sent through a prism, will produce absorption-bands similar to those of blood?" Having tried all the ordinary red colours, animal, vegetable, and mineral, the author found none which produce the absorption-bands of blood; and this also is the result of Sorby's more extensive experience. A decoction of cochineal with ammonia has been said to possess similar optical properties, but in this liquid one broad black band obliterates entirely the yellow and orange rays of the spectrum. A solution of alkanet in alum gives two absorption-bands which might be mistaken for those of blood, but there is a third band at the end of the green rays where joining the blue. Even if this were overlooked,

the properties of such a solution are wholly different from those of blood, and the liquid could not be mistaken for it. No prudent witness would rely upon a spectral examination only, and thus any difficulty on this ground would be removed. This answer equally applies to another objection, namely, that a prepared solution of *turacine*, a red colouring principle in the feathers of the Cape lory (*Turacus albocristatus*), presents two absorption-bands, similar to those of blood in form and position (*Students' Intellectual Observer*, April, 1863, p. 165). A summary of this subject is given by Preyer ("Blutkrystalle," "Untersuch.," von W. Preyer, Jena, 1871). This work includes thirty-two coloured spectra of blood under its different conditions, showing how the absorption-bands vary in size, position, and number, according to the proportion of red colouring matter present, or according to the nature of the substance with which the red colouring matter is mixed. The matter may be summed up as follows, that although many substances may give absorption-bands closely resembling one of the many sets of bands produced by blood, there is no known substance which will change its bands by the simple process of alternately shaking up with air, and allowing the solution to settle with an added deoxidising agent.

There can then be no room for doubt in answering very definitely "Yes" or "No" to the question, "Does this stain show the presence of blood?" There are a sufficient number of definite corroborative tests to render complete proof.

2. Is it Human Blood?

When marks of blood have been detected on the dress of an accused person, it is by no means unusual to find these marks accounted for by his having been engaged in killing a pig, bullock, or sheep, or in handling fish or dead game. Of course every allowance must be made for a statement like this, which can be proved or disproved only by circumstances; but the question here arises, whether we possess any *certain* means of distinguishing the blood of a human being from that of an animal. Possibly hairs, feathers, fish-scales, etc., imbedded in a bloodstain may indicate its origin.

In a few cases, the situation of the stains on different and remote parts of the dress, back and front, as well as in concealed or covered parts, may show that the defence is inconsistent with the facts; but, in the large majority a medical witness will be pressed to state whether the blood is or is not human. It has been already observed that there are no *chemical* differences between the blood of man and animals. The red colouring matter, the albumen, and the fibrin are the same, and chemical tests produce on them precisely similar results. Thus, neither the guaiacum process nor spectrum analysis will enable us to distinguish human from animal blood. These methods of research simply allow us to speak to the presence or absence of the red colouring matter of blood; but on the question whether the blood has been taken from a human being, or from any warm or cold-blooded animal, they throw no light.

The only possible chances the medical jurist has of determining this important point are (1) the employment of the microscope, and (2) the physiological test.

Microscopical Answer to the question "Human or not?"

We have already seen that the objects seen under the microscope are (*a*) red corpuscles, (*b*) hæmin-crystals; and each of these require discussion.

(*a*) *The corpuscles as an answer to the question Human or not.*—It must first be laid down as an absolute hard and fixed rule, which cannot be too much emphasised, that it is only recent blood, the corpuscles of which have had no opportunity of drying, which can be submitted to this test with any hope of a decisive answer being obtained. The reason for this absolute rule is that we have to rely upon three characters, viz., the shape, the size, and the presence or absence of a nucleus, for our decision; and when blood is dried on clothing, and it becomes necessary to extract the corpuscles by means of a liquid of a different nature from the serum, we cannot rely on slight fractional differences in shape and size, since we cannot be sure that the corpuscles, after having been once dried, will ever reacquire in a foreign liquid the exact conditions which they had in serum (see "Guy's Hosp. Rep.," 1850, p. 412); and it is hopeless then to try to find a nucleus in a condition to be recognised as such.

It may, however, happen that blood be submitted for analysis in a condition in which these points are capable of determination, and they must therefore be considered.

The microscope shows physical differences in reference to the shape of the blood-corpuscles in animals of different classes; and in reference to *size* in animals of the same class. 1. In respect to *shape*. In all animals with red blood, the corpuscles have a disc-like or flattened form. In the mammalia, excepting the camel tribe, the outline of the disc is *circular*. In this tribe, and in birds, fishes, and reptiles, the corpuscles have the form of a lengthened ellipse or *oval*. In the three last-mentioned classes of animals they have a central nucleus, which gives to them an apparent prominence in the centre. The blood-corpuscles of all the mammalia, including those of the camel tribe, have no central nucleus, and they appear depressed in the centre.

The microscope, therefore, enables an observer to distinguish the *fresh* blood of birds, fishes, and reptiles from that of a human being; and this may be of great importance as evidence. In *Reg.* v. *Drory* (Essex Lent Ass., 1851), it was suggested in the defence that the blood-stains on the clothes of the prisoner had been caused by his having killed some chicken. The shape of the corpuscles negatived this part of the defence. In another case, the blood was alleged to be that of a fish; this was also disproved by the shape. Bennet on one occasion was called to see a patient who was spitting florid blood. On examining the sputum with a microscope, he found that the coloured blood-corpuscles were those of a bird. On his telling the patient that she had mixed a bird's blood with the expectoration, she was astounded, and confessed that she had done so for the purpose of imposition ("The Microscope as a Means of Diagnosis," p. 185).

The chief microscopical distinction between the *blood of man and domestic animals* consists in a minute difference in the *size* of the corpuscles. This, however, is only an average difference; for the corpuscles are found of different sizes in the blood of the same animal.

In making use of this criterion, it would be necessary to rely upon the size of the majority of the corpuscles seen in a given area, and under the same power of the microscope. Their size bears no relation to the size of the animal. Thus in the horse, ox, ass, cat, mouse, pig, and bat, they are, on an average, nearly of the same size; the difference is so slight as to be practically inappreciable. In these animals they are smaller than in man and in several of the mammalia. The corpuscles in man, the dog, the rabbit, and the hare are of nearly the same size. In the blood of the sheep and goat, they are smaller than in other mammalia. The size of the corpuscles bears no proportion to the age of the animal; thus in the blood of the human fœtus they are found to be as large as in the adult.

It is now recognised by all hæmatologists that the size of the human red corpuscles varies from 6·5 μ to 8·5 μ, and even these measurements have to be taken as an average. The following table is taken from Laudois and Stirling's "Physiology":—

Size (μ = 0·001 millimetre).			
Of the Disc-shaped Corpuscles.	Of the Elliptical Corpuscles.		
	Short Diameter.		Long Diameter.
Elephant . . 9·4 μ	Llama . . 4·0 μ		8·0 μ
Man . . 7·7 ,,	Dove . . 6·5 ,,		14·7 ,,
Dog . . 7·3 ,,	Frog . . 15·7 ,,		22·3 ,,
Rabbit . . 6·9 ,,	Triton . . 19·5 ,,		29·3 ,,
Cat . . 6·5 ,,	Proteus . . 35·0 ,,		58·0 ,,
Sheep . . 5·0 ,,			
Goat . . 4·1 ,,			

To these may be added:—

Mouse . .	6·6 μ	All these are average measurements.
Hare . .	7·1 ,,	
Donkey . .	6·3 ,,	
Pig . .	6·0 ,,	
Horse . .	5·5 ,,	
Cow . .	6·3 ,,	

It will be noted that, with the exception of the sheep, goat, and horse, these measurements lie practically with the extremes of human measurements, and in medico-legal cases it is extremes that will be demanded, and not averages. It is true that by using very high powers of the microscope (a-one-twelfth oil immersion lens) these differences may be greatly magnified, but the conclusion at which Dr. Taylor arrived may still be set up as an example to be followed, viz.:—

The extent to which a medical witness is justified in going on trials for murder, on which this important question frequently arises, appears to be this: the size and shape of the corpuscles are or are not consistent with their being the corpuscles of human blood; but it is impossible, in the present state of science, to affirm that the corpuscles extracted from stains dried on clothing or weapons are not those of some domestic animal belonging to the class mammalia. This was the

substance of the evidence which the author gave in the case of *Reg.* v. *Munro* (Cumberland Lent Ass., 1855)—a case in which everything turned on circumstantial evidence of a medical and moral kind. He declined to say absolutely that the stains were caused by human blood, although the corpuscles coincided in measurement with them. In one instance a medical witness professed to make a distinction between certain spots on a man's clothes, assigning some to the blood of a horse, and others to human blood; and on another occasion scientific evidence was so strained by a witness upon this question as to elicit a sharp rebuke from the judge who tried the case (*Reg.* v. *Nation*, Taunton Spring Ass., 1857, see p. 536; also *Med. Times and Gaz.*, 1857, 1, p. 365). Evidence based upon such varying averages as those above given must be treated as speculative and unsafe.

For all that it is but fair to mention that Richardson, of Philadelphia, U.S. (*Amer. Jour. Med. Sci.*, July, 1874), asserts that he has been able, by the use of higher powers up to 750 diameters and by other appliances, to distinguish, under favourable conditions, the blood of man from that of such animals as the ox and pig, and to give evidence thereon on certain trials for murder.

It will be understood that, as the magnifying power increases, the relative difference in the size of the corpuscles is more apparent. Thus, when at 300 diameters it would be scarcely possible to distinguish the blood of man from that of the pig, at 650 diameters the difference in size may be well marked. Seiler's process is described in the *Amer. Med. Times*, February 19, 1879, p. 249. The larger size of the corpuscles in human blood is at once perceptible, and it may be observed that the smallest of the human corpuscles thus highly magnified is larger than the largest of those in the pig. This observation was made on fresh blood, for Seiler candidly admits that he has not been able to obtain satisfactory results with dried bloodstains, the problem which in practice most commonly presents itself for solution.

In all cases in which the microscope is employed for the examination of blood-corpuscles, a comparison of the sample should always be made with the kind of blood, whether human or animal, which it is supposed to represent.

In general it is found sufficient if the witness can say that the bloodstains on an article of dress have the characters of mammalian blood, and might be the blood of a human being. The blood of birds, fishes, and reptiles presents no difficulty, and in trials for murder the statement of a prisoner is occasionally proved false by the medical evidence derived from the microscope. A prisoner was charged (*Reg.* v. *Ward*, Leeds Ass., November, 1878) with murder and highway robbery. The deceased was found dead, with marks of severe blows on the head. Among other circumstances which connected the prisoner with this crime was a large spot of blood upon his trousers. When asked to account for this, he said it was the blood of a fowl. The medical witness was able to state that this was not the blood of a bird, but of a mammal. Poachers have their clothes often stained with blood in contests with gamekeepers. The stains have in these cases been sometimes referred to the carrying of pheasants or partridges, but the medical evidence has shown that the form of the corpuscles was inconsistent with this defence.

(b) *Hæmoglobin and Hæmin Crystals under the Microscope as an Answer to the Question "Human or not?"*—These crystals, like the corpuscles, give indisputable evidence of blood, and it has been asserted that it might be possible from the characters of the crystals to determine from what species of animal, including man, the blood was derived.

It must be admitted that the shape of the *average* crystal of human blood differs materially from that of the squirrel, the sheep and ox; those of human blood are commonly rhombic plates in outline, while those of the animals above named are more or less hexagonal; but the editor can find no reference to any attempt to prove that these shapes and those of the crystals derived from other domestic animals are absolutely constant. Indeed, what reference there is to be found on the matter states distinctly that the appearances differ somewhat according to the exact minutiæ of the procedure adopted to obtain them. Hence in any case of practical importance it would be absolutely essential that control experiments with known blood should be performed, and even then the utmost that could be said would be, the crystals obtained from the two sources are so nearly alike as to be consistent with the view that they were both derived from the same kind of blood.

Copeman in the St. Thomas' Hospital Report, 1888, p. 95, asserts that human blood, as well as that of the monkey, crystallises in the form of reduced hæmoglobin, while that of all other animals crystallises in the form of oxyhæmoglobin; and that the spectroscope reveals this difference. A few drops of putrid serum suffice to bring about crystallisation of the pigment in a solution of blood. To distinguish between the blood of man and the monkey, it suffices to note that the crystals of human reduced hæmoglobin are almost invariably rectangular plates, while those from monkeys' blood are for the most part diamond-shaped plates, or else hexagonal plates, like those of the sheep and ox. The editor has the opinion of two distinguished physiologists, Messrs. Vernoon and T. C. Brodie, that animal hæmin crystals are indistinguishable from human hæmin crystals. Moreover, considering the stability of hæmin throughout the vertebrata, it is not to be expected that they should differ.

Considering, then, the summary of the evidence derivable from the microscope, one is not justified in swearing to any stronger statement than "that what has been observed under the microscope is compatible with, and to some extent corroborative of, other facts." To go beyond this or to let the microscopic evidence stand alone is unjustifiable in the present state of scientific knowledge.

In some few cases a strong argument may be obtained from the position of the stains, together with their extent, *e.g.*, on chemise or drawers, situations, that is, which are not likely to have been in contact with animal blood, but this kind of circumstantial evidence is on a totally different footing to scientific evidence.

Physiological Answer to the Question "Human or not?"

We have now to describe two final tests for human or animal blood, and these may both be termed physiological. The first is described by M. Cotton in the *Bull. Général Thérapeut.*, and may be summarised as follows. It will require much confirmation before it assumes a fixed place in the decision of then all-important question.

First Physiological Test.—If a solution of peroxide of hydrogen be added to another oxidising agent, such as the permanganates or iodic acid, a double decomposition takes place, each tries to oxidise the other, and consequently oxygen is set free from both. If the base present forms a stable oxide, the reaction ceases when this is arrived at, as is the case with the permanganates, otherwise it goes on to complete deoxidation, as with iodic acid. Blood-corpuscles behave like iodic acid: they lose all their oxygen while releasing a varying proportion of the oxygen from the peroxide; and M. Cotton has made the remarkable discovery that human blood releases a very much larger proportion than does that of the ordinary domestic animals, viz., twice as much as that of the horse, four times as much as cows' and ten times as much as sheep's blood. For example, if 1 c.cm. of defibrinated human blood be added to 250 c.cms. of a twelve-volume solution of peroxide about 600 c.cms. of oxygen are disengaged, while if the same be done with sheep's blood only 60 c.cms. of oxygen are given off.

The Second Physiological Test for Human Blood.—This test is still (1903) on its trial, but it seems to offer the very greatest of possibilities for the settlement of the all-important question, "Is this human blood?" It takes its origin from the physiological laboratory as an offshoot from experiments on immunity, in which the blood of one animal was injected into the veins of another of a different species. It was found that the foreign corpuscles thus introduced were in some way destroyed by the elements of the receiver's blood, and that, in consequence of the activities thus invoked, the serum of the blood of the receiver had developed the power of causing a cloudiness or precipitate to occur in a clear solution prepared from the blood of the giver. Since the commencement of the investigation it may fairly be said that thousands of experiments have been performed in the laboratories of the world, and the following conclusions seem to be justified:—

(*a*) That the original observation was correctly based on fact, and that so-called precipitins can be called into activity in any animal's blood.

(*b*) That the blood of an animal (the receiver) thus treated by injections reacts in this peculiar manner only specifically, *i.e.*, only to a clear solution obtained from the blood of that particular species of animal whose blood has been used for the injections.

(*c*) The precipitating power of the receiver is a vital function, which increases with repeated injections to a maximum at which by suitable precautions it can be maintained for some time, but declines to vanishing point after a certain length of time after the cessation of injections.

There are numberless other statements that might be made upon the matter, but really the only one of medico-legal importance is the proof of the absolute constancy of paragraph (*b*) above. Some years ago Dr. Stevenson submitted eight samples of bloodstains to a scientist for this method of proof: he received back six correct and two incorrect replies; but since then methods have improved, particularly in the direction of paragraph (*c*) above, and it is now claimed that in the hands of skilled observers the results are absolutely trustworthy.

The details of procedure so far as the simple test is concerned are

as follows. The medical jurist will have an interest only in proving a stain is or is not human. He accordingly takes a little human blood, and injects some into a favourable receiver (the best receiver, and the number of injections, and the time that must elapse for the maximum development of precipitating power are all matters needing the greatest skill and experience); he then bleeds the receiver to a sufficient extent to be able to get a small quantity of clear serum. This serum is then added to a clear solution obtained from the suspected stain. If this latter be really human the mixture of serum of the animal and clear solution from stain will become cloudy, and a precipitate ultimately fall. The experiment is useless naturally unless the earlier tests have proved beyond doubt that the stain is derived from blood of some sort.

For further details the reader is referred to *Lancet*, 1, 1902, p. 143, also to a work by Nuttall, of Cambridge, on "Blood Immunity and Blood Relationship" (1904), in which a whole chapter is devoted to the special medico-legal relationships of this precipitin test.

3. How Old is the Stain?

This is a somewhat subsidiary question, which may, however, become of vital importance. The answer to it depends upon the fact that when once blood has been shed and exposed to atmospheric and other influences its hæmoglobin rapidly undergoes changes, the principal one being the conversion into methæmoglobin, which is probably oxy-hæmoglobin, in which the oxygen is not only in excess, but is in some slightly different combination with the hæmoglobin; some of it is also broken down into hæmatin and globulin. These changes themselves are well known and more or less perfectly understood, but what is not clearly defined is the rate at which they take place nor the time requisite for the total conversion. We know that the more acid there is in the air the more rapidly is the change produced, but it is impossible to say that this is the only atmospheric impurity that can effect the change, nor is it possible to state the amount of the acidity in the particular air to which any given stain was exposed. The physical change to the eye in a stain produced by these chemical processes is one of colour from red to reddish brown; hence, supposing the stuff to be white or nearly colourless, the spot of blood if *recent* is of a red colour; but sooner or later it becomes of a reddish brown or of a deep red-brown colour. The change of colour to a reddish brown may take place in warm weather in less than twenty-four hours. After a period of five or six days, it is scarcely possible to determine from the appearance the *date* of a stain even conjecturally. In a large stain of blood on linen, no further obvious change took place during a period of fifteen years. It had a reddish brown colour at the end of six weeks, which it retained for the long period mentioned. Indeed, it is very difficult in any case, after the lapse of a week, to give an opinion as to the actual date of a stain. The stain may not be so readily dissolved by water, but no chemical test applied to the solution can enable a chemist to fix the date. Blood of one week's and blood of six weeks' date may present the same chemical properties. This question arose in the Eltham murder case (*Reg.* v. *Pook*, C. C. C., July, 1871). Letheby, who examined the prisoner's clothing, very properly declined to assign a date to the small stains which he had found upon it.

Spectrum analysis applied for the purpose gives no precise data of time. It will show the presence of oxy-, or reduced, hæmoglobin, methæmoglobin, or hæmatin, but this is immaterial beyond the bare fact that we are not dealing with absolutely fresh blood if the spectra of methæmoglobin or hæmatin are present without preliminary treatment. Heat also affects the appearance of a bloodstain. Blood dried in a pure atmosphere and kept from air may retain its chemical character of freshness for a long time. Pfaff performed numerous experiments on fresh and old bloodstains, with a view of determining their age or the date at which they were produced (Casper's *Vierteljahrsschrift*, 1862, 1, 266). He considers that the rapidity with which the red colouring matter dissolves in water and other liquids may constitute a safe basis for a medical opinion. It has been long known that the fresher the blood the more easily is the red colour imparted to water. It has also been pointed out that in fresh stains the colour is crimson red, while in old stains it is brown or red-brown. The novelty of Pfaff's suggestion consisted simply in fixing the age of the stain on linen and other stuffs by the time required for the commencement and completion of the solution of the red colouring matter. The solvent employed by him is a solution of arsenious acid in distilled water, in the proportion of one grain to two drachms of water. This is a good solvent for the red colouring matter. In operating on stains on linen and other stuffs, the rapidity of solution must, however, depend on so many contingencies irrespective of age—*e.g.*, the quantity of the blood, the nature of the stuff, its thickness, and its permeability to liquid—that no definite rules can be safely laid down for determining the precise date. Tidy endeavoured to establish the age of bloodstains by means of the spectroscope. Upon coloured stuffs, or dirty clothes, it is of course impossible to trace any physical changes in stains of blood; on red-dyed stuffs the stain appears simply darker from the first, but in all cases the fibre of the stuff is more or less stiffened as a result of the drying of the albumen with the red colouring matter.

4. Is the Blood Arterial, Venous, Menstrual, Man's, Woman's, Child's?

It is not possible to distinguish *arterial* from *venous* blood by any physical or chemical characters when it has been for some days effused, and is in a dry state upon articles of dress, furniture, or weapons; but this, in medico-legal practice, is not often a subject of much importance, since there are few cases of severe wounds, either in the throat or other parts of the body, in which the two kinds of blood do not escape simultaneously. The most striking and apparent difference between them, when recently effused, is the *colour*, the arterial being of a bright scarlet, while the venous is of a dark red hue; but it is well known that the latter, when exposed to air for a short time, acquires a florid red or arterial colour; and the two kinds of blood when dried cannot be distinguished chemically by any known criterion. If a coat or other stuff, stained with blood, were of a dark colour, the liquid would be absorbed and speedily lose its physical characters. The microscope shows no appreciable difference in the blood-corpuscles of arterial and venous blood, and chemistry does not

enable us to apply any test so as to make a satisfactory distinction between them. The question of arterial or venous blood will receive just a slight suggestion of a clue in the next paragraph in answer to the question, Did the blood come from a living or dead body? With regard to the rest of our present question it may be remarked there is no method known by which the blood of a man can be distinguished from that of a woman, or the blood of a child from that of an adult. The blood of a child at birth forms a thinner and softer coagulum than that of an adult, and some of a new born baby's corpuscles are nucleated. A medico-legal question has arisen, on more than one occasion, whether there were any means of distinguishing *menstrual* blood from that of the body generally. This liquid yields fibrin, and contains red colouring matter and the other constituents of blood. The only differences noticed are of an accidental kind: (1) that it may be acid (fresh blood is alkaline), owing to its admixture with vaginal mucus; and (2) that under the microscope it may be mixed with epithelial scales, which it has derived from the mucous membrane in its passage through the vagina. In the bodies of women who had died suddenly while menstruating, Webber found coagulated blood upon the uterine mucous membrane. If, therefore, menstrual blood does not coagulate, it is simply because it has already coagulated within the uterine cavity, and cannot do so again; it is more fluid than ordinary blood, because, during its trickling descent, it becomes mixed with watery uterine and vaginal mucus (Schmidt's *Jahrb.*, 1847, 7, 139). A case occurred in France which induced the Minister of Justice to refer the consideration of this question to the Academy of Medicine. The reporters, Adelon, Moreau, and Lecanu, came to the conclusion that there were no means of distinguishing menstrual blood dried on clothing from that which might be met with in a case of infanticide or abortion ("Ann. d'Hyg.," 1846, 1, 181). If none of these accidental circumstances are favourable it is not to be expected that anything else will help.

5. Did it come from a Living or Dead Body?

It is well known that blood in the act of dying produces a clot of fibrin, and the only two possible chances of answering the above question are (*a*) the discovery of this fibrin; (*b*) noticing the physical characters of the spots of blood.

With regard to the first point it must be noted that chyle and lymph also possess the property of coagulation with the production of fibrin. Hence evidence must first be obtained of the existence of hæmoglobin in a stain. Supposing this to have been done, and further that the hæmoglobin has been completely abstracted, and a small quantity of fibrin has been left behind as insoluble, these fibrils of fibrin must be identified as such, a by no means easy task, and even then all that can be said is that the blood came from either a living person or from one who had been dead something under three or four hours, the time, *i.e.*, in which the blood left in the vessels commences to coagulate. *Per contra*, if the quantity of blood examined be comparatively great, and no fibrin can be procured from it after complete digestion in cold water, it is probable that this blood has not come from a living body, and that it is merely a mixture of red

colouring matter and serum, like that found in the vessels of the dead body after coagulation.

With regard to the second point, it is alleged that the fact of the blood having come from the arteries of a living person will be indicated by its being *sprinkled* over surfaces upon which it has fallen, while the venous blood is always poured out in a full stream. In most wounds which prove fatal by hæmorrhage, the blood is poured out simultaneously from arteries and veins. The sprinkled appearance of the blood, when it exists, will, *cæteris paribus*, create a strong presumption that it was poured out from a *living* body, for after the heart has ceased to act the arteries lose the power of throwing out the blood in jets. This mode of distinguishing arterial from venous blood was adduced as evidence in the case of Sellis, who destroyed himself after having attempted to assassinate the Duke of Cumberland. There was the appearance of sprinkled blood on the coat-sleeve of Sellis, and it is stated that the temporal artery of the Duke had been wounded. Sir Everard Home thence inferred that Sellis had attacked the Duke and wounded the artery, which had led to the sprinkling of the sleeve (Will's "Circ. Evid.," 89). This method of distinguishing the two kinds of blood, therefore, may be occasionally available for practical purposes; but it must be remembered that accident may lead to the sprinkling of blood from a small vein which has been wounded, while blood may be poured out in considerable quantity from an artery, especially if large; and if it fall on one spot at a short distance, it may produce a soaked appearance. The sprinkling may be expected only when the wounded artery is small, and the blood is effused at a distance. This is a fact which a medical jurist should not overlook, although, for the reasons stated, too great a reliance must not be placed on it. The spots of blood, if thrown out from a living bloodvessel, speedily consolidate, and the fibrin, with the greater portion of the colouring matter, is found of a deep red colour at the lower part of the spot, the upper portion being of a pale red. The lower and thicker part has commonly a shining lustre, as if gummed, when the spot is recent, and when it has been effused upon a non-absorbent surface. This glazed appearance is probably given by the evaporation of the aqueous and the rapid desiccation of the albuminous portions. In *Reg.* v. *Spicer* there was a wound of the temporal artery of the deceased woman. A brick in the wall, opposite to the spot where the wound was inflicted, presented the appearance shown in fig. 7.

Fig. 7.



Spots of arterial blood sprinkled on the surface of a brick from a wound of the temporal artery (*Reg.* v. *Spicer*, Berks Lent Ass., 1846).

The size and direction of the spots vary according to the distance of the person wounded and the direction in which the spurting has taken place against the surface. When blood falls upon porous articles of clothing, as linen or cotton, it is absorbed, and produces a dull stain. In dark-coloured articles of dress, it is sometimes difficult by daylight

to perceive these stains. The part appears stiffened, and has a dull red-brown colour, which is sometimes more perceptible when seen by the reflection of the light of a candle.

6. Did the Blood come from Victim or Assailant?

It is obvious that there can be here no possible scientific evidence, except under such extraordinary circumstances of disease of the blood in one or the other, and with opportunities for examining the stains while fresh, so that the possibility must be ruled out, it would so rarely occur. The only clue at all likely to help in the dead body is to notice upon which side of a garment the blood has been shed and coagulated; if it can be positively determined that the inside of a garment worn by the deceased was the side upon which the blood was shed, this is, so far as it goes, suggestive that the blood came from the victim, and the assailant is suggested if the outside is chiefly stained; but it is very easy to imagine conditions of the dress under which even these slight suggestions would cease to have any value.

Large pools of blood near a body which has had a large vessel wounded and has bled to death are again strong presumptive evidence in favour of their origin from the victim.

The matter can, however, only be determined by circumstantial evidence, the variations in which are unlimited.

This completes the subject of identification of bloodstains. Under the heading of "Wounds" will be found many cases illustrative of the value of the identification when made.

16. B. **Tests for Seminal Stains.**—Inasmuch as emission is not required in law to constitute rape, and as it is possible that an examination of stains for spermatozoa might be required for other purposes than mere rape, the details of how to examine such stains are inserted here as a completion of identification; for cases in which such examinations have been demanded *vide* Section on "Rape."

As in the case of blood, the examination may be said to consist of several distinct processes.

1. Inspection with naked eye and lens.
2. The application of heat to the spot.
3. The preparation of material for
4. The microscopical test.

1. *Inspection with Naked Eye and Lens.*—In nearly all cases the stained articles are presented for examination in the dried state. It is but rarely that a case occurs in which a medical jurist is required to examine a liquid preparation of spermatozoa, though if a girl is brought to him *shortly after* an alleged rape, he may try to obtain living spermatozoa from the vagina, but then, of course, only the microscope can possibly be of any use at all. The appearance presented by such a stain on undyed linen or cotton articles—on woollen or other rough articles, and even on dyed smooth fabrics, any preliminary examination with the naked eye is absolutely useless—is like that produced by a dilute solution of albumen. It is of a faintly yellow colour, it is without odour (*vide* application of heat below), the stuff is stiffened slightly, and has a somewhat translucent appearance,

especially at the edges. There is nothing else to be noted *quà* semen, and these points are not in the least distinctive.

2. *The Application of Heat.*—The application of a few drops of very hot water or of heat to the spot is said to render the yellow coloration more distinct and to cause the spot to evolve the peculiar faint odour of the spermatic secretion.

3. *The Preparation of Material for Microscopical Examination.*—If the opportunity has occurred of examining the vagina it is only necessary to gently swab the mucous membrane with a small piece of cotton-wool lightly rolled on a probe and then to smear two or three microscopical slides with the moist surface of the wool. Add, if thought well, a drop of some staining reagent, such as iodine for example (*vide* below), or eosin, and examine the slide at once. If the stain be dry, the following method may be adopted:—The stained linen, or a part of it, should be cut into small pieces, taking care that it is not roughly handled. These should be placed in a small porcelain capsule or watch-glass, with a sufficiency of cold distilled water mixed with about 10 per cent. by volume of glycerine (eight or ten drops) to soak it thoroughly, and to allow the fibre of the stuff to become quite penetrated by the water. It is advisable not to move the stuff or agitate the liquid, but to allow it to be quietly imbibed. The watch-glass or capsule should be covered with another to prevent evaporation and to keep out foreign matters. After an hour the fibres may be turned and allowed to macerate for another hour. The stained linen may then be removed, and the soaked fibres of the stuff gently pressed on several glass slides, already well cleaned and prepared for this purpose. The liquid thus obtained by pressing the stained linen is slightly opaline.

E. Ungar ("Zeitschr. f. Gerichtl. Med.," 1887, 1, 316), adverting to the great difficulty often experienced of obtaining unbroken specimens of spermatozoa from dried seminal stains, states that this is not due solely to the separation of the head from the tail of the organism by mechanical rupture. Spermatozoa are indeed very brittle, and easily ruptured by any rough handling of the fabric on which they may be shed; but Ungar asserts that the separation of the head from the tail also takes place during the swelling of the dried spermatozoa when moistened with water for the purpose of examination. His method of examination is as follows. A piece of the fabric with the stain is moistened with very dilute hydrochloric acid—one drop in 1½ fluid oz. of water—on a watch-glass, with one end of the stuff only immersed in the liquid; and the soaking is continued for five hours. The fabric is then removed with forceps and dropped several times on to slides, avoiding tearing and much pressure. The liquid on the slides is then allowed to dry in air. A cover-glass held by means of forceps is then passed two or three times through a naked flame and then deposited on the slide, which is then placed with the prepared surface downwards in the staining fluid (2½ per cent. eosin in spirit). When the staining has proceeded for a sufficient length of time, the slide is removed, washed with dilute alcohol and examined. Or, a second staining may be given with hæmatoxylin, in which case the hinder part of the head acquires a deep blue tint, whilst the front and middle of the head and the tail are stained deep red.

4. *The Microscopical Examination for Spermatozoa.* — Living spermatozoa move for many hours out of the body when kept at a temperature of 98° F., and even retain their rapid motions when the spermatic liquid is mixed with water; but these motions cease immediately on the addition of urine or chemical reagents. The spermatozoa may retain vitality (or free motion) in the body of a woman for the period of seven, or even seventeen days; hence in the fresh method mentioned above it may be quite possible to detect them in movement, and then there can be no possible mistake except that of *Trichomonas vaginæ*, which is, however, a very different looking object.

Under ordinary circumstances, however, the material on the slides should now be covered with a thin cover-glass, and examined by a microscope under powers varying from 300 to 500 diameters, in a strong oblique light. At 300 diameters the spermatozoa are visible, but owing to their great transparency require a careful adjustment of the microscope in order to be distinctly seen; the head often coming into focus before the long filamentous tail, and when this is seen the head may be lost. The spermatozoa are best seen in a good light, with a power of 500 diameters: the head is ovoid and flattened—sometimes rather pointed; the tail is from nine to twelve times the length of the head. Micrometrical measurements of two gave, for the total length including the head—in one the 1-750th (·00133) of an inch, and in the other the 1-1000th (·001) of an inch; the head, in its greatest diameter, was in each about 1-9000th (·00011) of an inch; the filiform tail tapers to a scarcely visible point. The spermatozoa are usually associated with granular bodies, and with epithelial scales. Fibres of cotton, linen, or wool, and other substances, may be also mixed with them; and they may be associated with pus, mucus, and blood-globules. Their form is so peculiar that, when once well seen and examined, they cannot be mistaken for any other substance, vegetable or animal, nor, with ordinary care, can any vegetable fibres be mistaken for them.

Is this Stain Produced by Semen?

It may be at once stated that the preliminary naked eye examination and the application of heat for the odour are absolutely valueless standing alone, and the only way in which a *positive* answer can be given is by the discovery under the microscope of *at least one unbroken* spermatozoon; if unmistakeable in appearance, one such is, however, sufficient.

The microscopical detection of spermatozoa in dry stains is attended with some difficulty when the stained stuff has been much rubbed or worn, or is of very coarse nature. The heads are too much like cellular débris, and the tails too much like minute fibres, of silk, say, to allow an opinion to be based upon fragments only.

In order to render the spermatozoa more distinct under the microscope, Roussin has recommended the employment of a solution of iodine in water. Iodine does not alter the size or shape, but causes the bodies to appear in stronger relief. The proportions of the ingredients which he recommends are iodine one part, iodide of potassium four parts, water one hundred parts (*op. cit.*, p. 156). Iodine

thus used gives a strongly-marked yellow colour to animal and vegetable substances, while it does not alter mineral matters. It brings out the form of the spermatozoa in colour. He has not found that the act of drying in any way alters or modifies the forms of the spermatozoa. The latest and best stain for spermatozoa is eosin and methyl green. At the base of the head is a hemispherical portion which stains green, the head and tail staining pink.

Starch, it is well known, is rendered blue by iodine. As stained articles of dress sent for examination may contain starch used for washing purposes, the liquid may acquire a bluish colour on the addition of iodine, forming a strong contrast with those bodies which are turned of a yellow colour by iodine. In one case in which Roussin was required to examine spermatic stains on a dress in a case of alleged rape, he was surprised to find, on the application of iodine, that there was distinct unbroken granules of wheat-starch and potato-starch of a blue colour. These could not have been derived from the starch used in washing, as the granular structure is there destroyed, and, further, the granules were found only in the spermatic stains, and not on other parts of the linen. It turned out on inquiry that the man used flour in his business, that there was an open sack of flour at the foot of the bed on which he had committed a rape on the little girl; some of this had been spilled in the struggle, and had adhered to the stains on his shirt. The flour in the sack when examined proved to be a mixture of wheaten flour and potato-starch. This discovery furnished strong evidence against the prisoner at the subsequent trial ("Ann. d'Hyg.," 1867, 1, p. 163). Pincus has adopted another method of rendering these transparent bodies more visible. He discovered accidentally, on re-examining a slide on which the watery solution of a spermatic stain had been allowed to dry spontaneously, that many of these bodies which were only indistinctly seen while moist, were now very prominent and distinct in their form, and those which before appeared tailless now assumed their complete shape and length. They became in fact more opaque and distinct by drying. On repeating the experiments, he found the results satisfactory; but the drying should take place slowly, *i.e.*, by covering the liquid on the slide with the microscopic glass and keeping it in a cool place (Casper's *Vierteljahrsschr.*, 1866, 2, p. 349).

The detection of dead or motionless spermatazoa in stains may be made at long periods after emission, when the fluid has been allowed to dry. In three cases, at intervals of from one week to seven weeks after the perpetration of the crime, Casper was enabled to demonstrate the presence of spermatozoa on articles of clothing, and thus to furnish corroborative evidence (*op. cit.*, vol. 2, p. 161). Koblanck made experiments on this subject, in reference to different periods of time; he found these bodies distinctly, after three days, one month—three, four, six, nine, and even twelve months. The number of distinct and perfect bodies diminished according to the length of the period at which the examination was made. Thus, at the end of a year, only two perfect specimens could be perceived; but it may be stated, that the discovery of one distinct and entire spermatozoon is quite sufficient to justify a medical opinion of the spermatic nature of the stain. Bayard states that he has been able to detect spermatozoa in dry

stains after six years ("Man. Prat. de Méd. Leg.," p. 277); Dr. Stevenson has found them after a period of five years; and Roussin after the long period of eighteen years ("Ann. d'Hyg.," 1867, 1, p. 152).

Dr. Maidlow, of Ilminster, in 1903, related a case to the editor in which he had been able to find a spermatozoon complete, and therefore definitely proving a seminal stain, after a sheet had been washed. The statement may be accepted as accurate, but it only seems to prove careless or incomplete washing; but it further shows that if the locality of a stain can be fixed it may be worth while to examine even a washed article of underclothing.

Does the Absence of Spermatozoa Negative the Stain being Seminal?

An opinion to the effect that "No spermatozoa—not semen," has been expressed by a medical jurist of some repute. It is not necessary to refer to the extraordinary difficulty of proving a negative in experimental work, for there are well-recognised conditions under which spermatozoa are absent from seminal fluid; thus, they are not found in the very young, the very old, or in those who are labouring under long-standing disease of the testicles. Even in the cases of healthy married men, who have had children, spermatozoa are not always found in the spermatic secretion; their presence, size, and number are subject to great uncertainty. Exhaustion from frequent intercourse, or constitutional causes, without actual bodily disease, appears to influence their production. There are also various other conditions in which they are not found; these have been fully examined by Casper ("Gerichtl. Med.," vol. 2, p. 141), and the numerous cases which he has collected clearly establish this conclusion. The discovery of spermatozoa in stains on articles of clothing demonstrates that the stains have been produced by the spermatic liquid; but it must be most emphatically stated that the non-discovery of spermatozoa in a given stain does not prove that the stain is not seminal, any more than the fact of not finding an egg on the breakfast table proves that there are no hens in the world.

17. **Stature and Weight in Identification.**—If it were not that the obvious is so often overlooked, or taken for granted, one would say that in the living or recently dead (before the soft parts of scalp and soles of feet have disappeared), these two points were too obvious to require mention.

Exact observations of both points can easily and should invariably be made and recorded, and they thus become absolute facts in connection with a body that has been found.

In works on physiology, when the subject of growth is under discussion, tables of increase for age in these two points are commonly inserted, but they have no medico-legal interest, for they deal only with averages, and it is common knowledge that wide exceptions are very frequent indeed; thus, when evidence is required from a witness regarding a person whom he had known some time before, no reliance can be placed upon his suggestions as to what his expectation of height and weight would be; the Tichborne trial (*vide* below) is

an excellent illustration of the futility of such evidence. Within the editor's own personal circle of friends, at least two cases are known to him in which an attack of typhoid fever and measles, respectively, so altered the constitution, that on recovery the patients rapidly grew from a condition of meagreness to one of very marked obesity, and in one of the cases height increased, too, with very unusual rapidity.

The subject of stature in connection with fragments of a body, and with bones, possesses, however, very great interest, and will be found fully discussed below, under "Identity of Bones."

18. **Teeth.**—The teeth, under natural conditions of decomposition, are practically indestructible. They therefore offer over an almost unlimited time a very excellent means of identification. In infancy and childhood they are very fairly regular in their development and appearance through the gums, and thus afford a very useful criterion for the estimation of age in young subjects. We must fully discuss the teeth from both points of view.

A. The Teeth as a Means of Identity.

In any case in which identity may possibly come into dispute, observations on the jaws must be most carefully made and recorded. We may enumerate the following points :—

(*a*) The number of those left.

(*b*) The number lost, including any evidence of how long lost.

(*c*) The nature, *i.e.*, the names as ordinarily applied, of those left and those which have disappeared, and whether temporary or permanent.

(*d*) Any peculiarities in their arrangement, *e.g.*, prominent or the reverse, crooked or straight, crowded out of place, or not.

(*e*) The condition of those left, whether much worn or not, and their colour and cleanliness or the reverse.

(*f*) The presence of supernumerary teeth.

(*g*) A striking point is absolutely edentulous gums.

Again, observations on any dental work done in the mouth must be made :—

(*h*) Stopping, crowning, bridge work, and the material used for the purpose.

(*i*) Plates of gold or vulcanite of any particular shape and replacing particular teeth.

(*j*) Any peculiarities of mechanical appliances in the mouth for fixing or supporting any of the above.

The following cases illustrative of the importance of noticing these points are somewhat old, but are none the less instructive by reason of their having occurred so long ago ; and to obtain recent cases is not easy, by reason of the fact that it is but seldom that numerous other points of identity are not forthcoming.

Rex v. *Ross*, C. C. C., December, 1831 :—

It appeared in evidence, that the deceased, Caroline Walsh, an old Irishwoman, had been repeatedly solicited by the prisoner to come and live with her and her husband, but refused. By much persuasion on the part of the prisoner, however, she at last consented, and went for that purpose to the prisoner's lodgings in Goodman's Fields on the evening of August 19th, 1831, taking with her a bed, and an old basket,

in which she was accustomed to sell tape and other articles. From that evening all traces of the deceased were lost; and when the prisoner was required by her relatives to account for her disappearance, she prevaricated, but finally asserted that deceased had gone out early on the morning of that day, and had not returned. The testimony of the prisoner's son, who was the chief witness for the Crown, went to prove clearly, that the deceased had been wilfully suffocated on the evening of her arrival, by his mother (the prisoner) placing her hands over the mouth of deceased and pressing on her chest. He deposed that on the following morning he saw the dead body of the old woman lying in the cellar of the house, and on the evening of the same day he saw his mother leave the house with something large and heavy in a sack.

Now it happened most singularly that on the evening of August 20th, the day following the alleged murder, an old woman of the description of the supposed deceased, was found lying in the street in the immediate neighbourhood, in a completely exhausted condition, and in a most filthy and squalid state. On being questioned she stated that her name was Caroline Welsh, and that she was a native of Ireland. Her hip was found to be fractured, in consequence of which she was conveyed to the London Hospital, where she subsequently died, and was buried. The prisoner Ross, when apprehended, asserted that this was the female whom she was accused of having murdered. Hence, setting aside the direct contradiction given to this statement by the evidence of her son, it became highly important, for the ends of justice, that the identity or non-identity of the two women should be clearly established.

The extraordinary resemblance of names, and the exact coincidence of time and place, struck every one in court; but by the examination of about twenty witnesses, the following points of difference were elicited. It was proved that they were both Irishwomen, but Caroline Walsh came from Kilkenny, Caroline Welsh from Waterford. The former (the alleged murdered person) was eighty-four years of age, tall, of a sallow complexion, with grey hair, and had (an extraordinary circumstance for her years) very perfect incisor teeth. The latter, Caroline Welsh (who died in the London Hospital), was about sixty years of age), tall of stature, dark like a mulatto, but had no front teeth; in addition to which it was deposed by a medical witness that the alveolar cavities corresponding to them *had been obliterated for a considerable time.* The witness brought the skull and jaw into court—for the body had been purposely exhumed for this examination—but the judge, Lord Denman, would not allow it to be produced, and said he would be satisfied with the witness's statement respecting the condition of the jaws.

Other circumstantial points of difference were deposed to—as, for example, that Caroline Walsh was healthy, cleanly, and neat in her person, and her feet were perfectly sound. Caroline Welsh was considerably emaciated; she was in a dirty and filthy condition; her hip was broken, her feet were covered with bunions and excrescences, and one toe overlapped another. The dress of the two women was somewhat similar. That of Caroline Walsh was proved to have been sold by the prisoner Ross to different persons; and almost every article was reproduced in court, and sworn to by witnesses. The

clothes of Caroline Welsh were proved to have been burnt by order of the parish authorities. Both of these women had similar baskets in their possession: that of Caroline Walsh had no lid or cover, while that found on Caroline Welsh had a cover. Lastly, the body of the latter was taken up from the burial-ground of the London Hospital for the purpose of identification, and it was sworn by two of the granddaughters of Caroline Walsh not to be the body of their grandmother.

This is a singular case of disputed identity. We have a coincidence of name, time, place, age, occupation, and circumstances, so extraordinary that but for two circumstances it is probable that the prisoner would have escaped on the presumption of a mistake, the body of the deceased not having been found although all the dissecting rooms in London were repeatedly searched for it. These circumstances were—1st. That the relatives of the deceased swore that the exhumed body was not that of the missing woman; and 2nd, the medical proof of the entire obliteration of the alveolar cavities in the jaw of the exhumed body, proving that the incisor teeth must have been lost long before death, while several witnesses testified to the presence of these teeth, as a striking peculiarity in the missing old woman. Even had the features of the exhumed body been obliterated by putrefaction, the non-identity would have been established by this medical fact. The prisoner was convicted.

In 1864, a man named Weekly Ball was charged with the murder of a woman named Lydia Atlee, with whom he had cohabited. It appears that, while in the last stage of pregnancy, she had suddenly disappeared on July 22nd, 1850, and was never seen again. It was rumoured that she had been murdered, and the prisoner, who, it was alleged, had a strong motive for getting rid of her, was suspected of the act; but no legal proof could be obtained against him, and the matter dropped. On February 3rd, 1864, as a labourer was digging in a lane, by the side of a ditch near the village of Ringstead, in Northamptonshire, where the deceased and the accused had lived, he found a human skull and ultimately a skeleton, lying at full length with its face downwards. The medical evidence at the magisterial inquiry was to the following effect:—The skeleton was lying in a trench about twenty inches below the surface of the ground in a swampy soil. The feet were close together, the heels touching each other. From these facts Leete expressed an opinion that the body must have been buried naked. The skeleton, when laid out, was that of a middle-aged female, about five feet two inches in height. The bones were complete, excepting the right thigh-bone and skull, which were broken in their removal. He considered that the skeleton had been in the earth from twelve to twenty years. The missing woman was far advanced in pregnancy, but no *fœtal bones* were found. In reference to this, the surgeon stated that the bones of a fœtus contained more animal matter, and might have been decomposed, although he declined to swear that within the period of fourteen years they would have entirely disappeared. No hair was found, although sought for, and no traces of clothes of any kind could be discovered; but there was a singular fact conected with the lower jaw, by which it was supposed the skeleton could be identified as that of the missing Lydia Atlee. A witness stated that a *fortnight* before the woman was missing, he drew on the

left side the first molar tooth from the lower jaw. When the exhumed jaw was shown to him, this tooth was absent, and he affirmed that that was the place where he drew the tooth. He thus appeared clearly to identify the skeleton as that of the missing woman. The evidence of other witnesses was adduced to show that on the evening of July 22nd, 1850, the accused and Lydia Atlee were seen to go together into an orchard at the back of the accused's house. They were overheard quarrelling, and the woman's voice was identified, muttering the words, "I believe you mean killing me to-night." It appeared that the skeleton was found buried about a mile from this orchard. Markham said in reference to the pregnancy of the woman, if it was a nine months' fœtus, some of the fœtal bones ought to have been found with the skeleton; the hair might have disappeared in thirteen years. With regard to the lower jaw, he observed that if the tooth was extracted, it could not have been removed long before death. The cavity was partly filled up, a fact which might however be explained by the tooth having been extracted without one or all of its fangs.

Although the identity of the skeleton, as that of the missing woman, was thus left a little uncertain, the accused was committed for murder. In the meantime the ground was again searched for fœtal bones, and the result was that, about eighteen inches deeper in the earth, the skeleton of a full-grown man was found, foot to foot with that of the female skeleton above. That of the man was lying on its back, and the bones appeared to have been much longer in the ground. On this discovery, it was suggested that the spot might have been a gipsy's burial-place, in which one body was laid in a grave over another without the ordinary clothing. That the accused should select a spot a mile away from his dwelling for burying the body of a woman whom he had recently murdered, and that he should then place the body at full length, over another dead body just below it, was most improbable. The entire absence of the fœtal bones was another fact adverse to the alleged identity. The author was assured by an eminent dentist who examined the lower jaw, that the tooth, supposed to have been drawn a fortnight before death, is one of the most common teeth to be absent in the jaws of middle-aged persons, and further, that it might have been removed from the jaw for three or four months before death. There was nothing by which a more recent date could be fixed, as part of the cavity had been filled up by the usual osseous structure. At the assizes, the accused was discharged on bail.

On the trial of Webster for the murder of Parkman, the evidence given by a dentist, Keep, established the identity of the mutilated remains of the deceased, in spite of an attempt which had been made to destroy the jaws by fire. He deposed that about four years previously, he had made and fitted for Parkman sets of artificial teeth in blocks for each jaw. He saw Parkman with these teeth in his head, for the last time, about a fortnight before his disappearance. He then put a new spring to the teeth. He recognised the artificial teeth, taken from a furnace, by certain peculiarities about them, and also by their fitting the original plates and moulds, which he retained in his possession. The gold plates attached to them had been melted in an assay furnace, in an attempt to destroy the head of the deceased, but the greater part of this gold was recovered, and the artificial teeth, to

which the gold plates had been fastened, had acquired a pink colour from a portion of the finely divided metallic gold, showing that they had been submitted to a high temperature, but had not undergone fusion, although minute particles of gold were fused into them. The left side of the lower jaw presented a great natural irregularity. The block corresponded to this, and thus placed the identity of the jaws beyond dispute. (Report of Trial of Prof. Webster, Boston, U.S., 1850, p. 50.) Dental peculiarities frequently serve to assist identification. In the "Medico-legal Returns for India" (1868—9), it is stated that a wife was able to swear to the identity of her husband's skull, shown to her in open court, from a peculiarity of the incisor teeth of the upper jaw, brought to notice by the civil surgeon. It seems that these cases of identity from bones are very common in India. The records of 1869 contain nineteen reports upon bones and fragments. The character of the fragments were very various—a skull and a few bones picked out of a river, pond, or well, or gathered out of a jungle. In one of these cases an imperfect skeleton, alleged to belong to a man murdered eighteen days before, was brought for examination, and found to be the remains of a woman.

The importance of the teeth as a means of identification of deceased persons was well shown in the case of the late French Prince Imperial, in 1879. The body had been so much disfigured by his assailants that identification would have been extremely difficult but that the prince had had four small cavities in the first molar teeth filled with gold, and had met with a slight accident from a blow on the front teeth, which had made it necessary to file them a little, in order to smooth the enamel. These constituted signs which are unalterable even by ages, and they afforded an unerring means of identification, which, in this instance, was of great value.

B. The Teeth as a Means of Determining Age.

The alveolar cavities which contain the teeth are formed about the sixth month of intrauterine life, and at birth the rudiments of the whole of the temporary teeth and of the anterior permanent molars may be found in capsules within the gums and jaws; but it is not till the teeth break through the gums and appear as instruments of mastication that they are practically used as evidence of age. From the commencement of the temporary dentition, *i.e.*, about eight or nine months after birth, till the completion of permanent dentition, *i.e.*, roughly eighteen to twenty, they form the most valuable, because the most constant, sign of age in the absence of direct documentary evidence or other definite evidence from acquaintances. Tidy ("Legal Medicine," vol. 1., p. 210) quotes the following statistics, showing the value of such observations:—

"Out of 1,046 children examined for the purpose, there were 338 who were about thirteen, and no less than 298 of these would have been judged to be thirteen by their teeth alone, while thirty-six more would have been judged to be just below thirteen. There were 708 of nine years of age, and just above; of these 539 were up to the standard of teeth required."

In judging of age by the appearance of the temporary teeth, it has to be remembered that disease may influence the question materially,

rickets and other allied disorders of nutrition being well-known agents for delay, while congenital syphilis may antedate the eruption; but such diseases are very likely to betray themselves by the appearance of the teeth themselves, which may be ridged, irregular, or badly formed; and allowance may be made when such teeth are found in a dead baby's mouth. It must be admitted, too, that anomalies of dentition quite apart from any recognisable disease are very frequent; thus, many cases are recorded in which a child has been born with one or even two teeth through the gums, and even more frequent are cases in which teeth have been cut by the third, fourth, and fifth months.

The order in which the teeth appear is generally more fixed than the actual date at which any given tooth assumes its position, and hence the total number at any time apparent is of as much importance as their names. The jaws are thus most completely filled with teeth somewhere about the sixth or seventh year, when they contain—without premature loss—no less than forty-eight teeth, twenty perfect temporary, and twenty-eight permanent ones, more or less developed, behind the temporary ones they are to replace. In general the teeth in the lower jaw make their appearance before those of the upper. The following table gives the order and average date of appearance :—

Table of Dentition.

Temporary.		*Permanent.*	
8 months,	Lower central incisors.	6 years,	First molars.
9 ,,	Upper ,, ,,	7 ,,	Central incisors.
10 ,,	Lateral.	8 ,,	Lateral.
12 ,,	First molars.	9 ,,	First bicuspids.
18 ,,	Canines.	10 ,,	Second ,,
24 ,,	Second molars.	11 ,,	Canines.
		12 ,,	Second molars.
		17 to 21, or later	Third molars, or wisdom teeth.

In growing children the chances of losing teeth from decay or accident are considerable, and allowance must be made for this.

19. **Scars and Tattoo Marks.**—The period of time at which a particular wound was inflicted may become a medico-legal question, both in relation to the living and the dead. The identity of a person, and the correctness of a statement made by an accused party, may be sometimes determined by an examination of a wound or its cicatrix (scar). So, if a dead body be found with marks of violence upon it, and evidence be adduced that the deceased was maltreated at some particular period before his death, it will be necessary for a practitioner to state whether, from the appearance of the injuries, they could or could not have been inflicted at or about the time assigned. A case was tried (*Reg.* v. *Raynon*, Taunton Spring Ass., 1841), wherein evidence of this kind served to disprove the statement made by the accused. He was charged with maliciously cutting and wounding the prosecutrix. There was a cut upon his thumb, which he accounted for by saying it was from an accident that had occurred three weeks before. The medical witness declared, on examining it, that it could not have been

done more than two or three days, which brought the period of its infliction to about the time of the murderous assault. This led to a conviction.

The above is quite sufficient to show the importance of scars and tattoo marks, and further illustrative cases will be found below. In both classes of marks the following points must be carefully attended to and recorded in written notes:—

1. Their number.
2. Their exact situation.
3. Their size and shape and design (tattoos).
4. Their colour, the pigment (tattoos).
5. Consistency—*i.e.*, hard or soft, thick or thin, rough or smooth.
6. Painful or not.
7. Raised or depressed.

All important for mere identification purposes in the law of multiplicity of evidence.

Should there be a doubt as to the presence of a scar or tattoo it is a useful plan to rub the part well with the hand so as to excite the local circulation into greater activity; by this means we are able to get a stronger contrast between the natural and the adventitious colour of the part. A low-power lens should also be used in cases of doubt.

Having carefully noted all the above points, then more special questions will arise concerning—

A. Scars.

What is a Scar? How is it Formed?—To answer this question a very brief outline of the healing of wounds must be given. Whenever from any cause whatever a solution of continuity in tissues (other than the simple epithelium of the skin) is produced, nature repairs the injury by what is known as inflammation, the essential features of which are: (1) increased determination of blood to the part injured; (2) the escape into the breach and amongst the neighbouring tissues of an excess of blood-serum; (3) a similar escape of white corpuscles of the blood; (4) in consequence of these changes, and possibly (this is a disputed point amongst pathologists but has no interest for the medical jurist), in consequence of coincident activities in the tissues near the injury, there appear in and near the injury, a number of nucleated cells with two functions; some appear to die from irritation, and these form pus (in the healing by first intention of aseptic wounds these are reduced to a minimum, and pus, or dead cells, can only be discovered by the microscope, but they are there all the same; in septic wounds pus in visible quantity is always found in inflammation), others remain alive and become gradually converted into fibrous tissue; (5) along with this formation of fibrous tissue there is a development and growth of new blood-capillaries, by which it can be nourished. While these cells and new blood-capillaries are young, the tissue which they collectively form is known as granulation tissue, and this granulation tissue fills up the gap formed by the solution of continuity. As the cells become formed into fibres these fibres contract and so strangle and obliterate many of the newly-formed

capillaries; they at the same time may distort the original shape of the granulation tissue.

A scar, then, is simply fibrous tissue, with a few or many blood-capillaries—it contains no specialised tissues, these are too highly organised in man to be capable of repair by a reproduction of such special tissues. A scar in the skin is such fibrous tissue covered with a few layers of simple epethelium that have grown over it, but there is no pigment layer reproduced, hence any distinctive pigment in a scar is an abnormality probably due to disease, or at any rate it is adventitious, and not part of the scar proper; in like manner there are none of the glands of the skin, sudoriparous, sebaceous, etc., in a scar, nothing in fact but the afore-mentioned fibrous tissue.

What is the Time Required for the above Processes to be Completed?—This varies enormously according to the nature, size, cleanliness, etc., of the wound, the full consideration of which would take us too much out of legal medicine into clinical surgery, but the following propositions may be laid down as reasonable averages with which to compare any given wound.

(i.) In clean incised wounds, such as those made by a surgeon, kept aseptic, the edges are firmly united in about five or six days, and a definite reddish scar formed in something under a fortnight.

(ii.) In wounds which have suppurated (for ordinary purposes this means that septic organisms have gained access to the wound), the formation of granulation tissue proceeds gradually within the wound, starting from the time when the tissues have begun to get the upper hand of the microbes in the struggle for existence; the time occupied by this is quite indefinite, from say a week to two or three months, according to the size of the wound and the success of the treatment applied, *e.g.*, whether it can be kept at rest or not, and whether the antiseptic applications can reach all parts of it, etc.

(iii.) In small wounds on the fingers, etc., as ordinarily inflicted, a scab forms in about thirty-six to forty-eight hours, and if on removal of this some granulation tissue be found or attempts at scarring, it may safely be said that the wound was inflicted at least four or five days previously.

(iv.) In larger ragged wounds involving many structures caused by accidental violence, no appreciable amount of granulation tissue will be found under a week, and no real scar for at least two to three weeks.

(v.) The age and health of the wounded person have material influence even on these averages, though not always in the expected direction. Thus in many old people a wound will heal very kindly, while in an apparently healthy person septic influences may work much damage.

How Old is a given Cicatrix?—We have seen that a scar consists merely of fibrous tissue and blood-capillaries, and that the contraction of the former tends to obliterate many of the latter. Hence when first formed a cicatrix looks red or bluish and angry, and is tender. As its age increases, it becomes smaller, whiter, thicker, more shining and less sensitive; but there are such wide variations in the time taken to produce these changes that even averages are of no use beyond this, that in about two months or so a scar acquires those

permanent characters by which its individuality will be known during the life of its bearer. The editor has met with a scar which after thirty-five years still got red, shiny and angry looking when local irritation was applied to it. So that when once a scar has become firm and white there are no data of a medical nature which will enable us to say when the wound producing it was inflicted, whether two, ten, or even twenty years before.

Is a Cicatrix the Necessary Result of a Wound?—Assuming that the term wound implies a breach of continuity affecting the substance of the true skin (cutis), a cicatrix is always produced in the process of healing. Slight punctures or incisions with a lancet, and even leech bites affecting only the surface of the cutis, may leave no trace after a few weeks or months. In an even cut made by a very sharp instrument, especially if it is in the direction of the fibres of subjacent muscles and the parts are kept in close contact, the cicatrix is even, linear, and sometimes so small as to be scarcely perceptible; and if the skin is white, it may be easily overlooked. Wounds of this kind are not, however, commonly the subject of medico-legal inquiry. If, on examining a part, where at some previous time a stab, cut, or burn involving the cutis, is alleged to have been inflicted, we find no mark or cicatrix, it is fair to assume that the allegation is false, and that no wound has been inflicted, making due allowance for the fact that mere abrasions of the cuticle, or very slight punctures and incisions, often heal without leaving any well-marked cicatrices. In looking for such a cicatrix care must be taken to excite the local circulation by friction, as has already been noted in the introductory remarks.

How far does a Cicatrix Represent in Shape and Size the Wound that caused it?—Inasmuch as the granulation tissue out of which a cicatrix is formed, can originally only fill the gap that is produced, it is obvious that there must be a broad general likeness between a wound and its scar. Thus a short straight simple incised wound will have a straight linear cicatrix as a rule, and this will be the nearer the case the closer the edges have been kept in apposition while it was healing, and the more rapidly it healed; but if the incision was of some length so that the skin gaped, or if the wound suppurated at all, the cicatrix will probably be wider and thicker in the middle than at the ends. Wounds of irregular shape, lacerated and contused wounds, commonly leave irregular scars, but not every little irregularity of the wound is shown in the scar, especially if of old date, owing to the universal contraction which tends to distort or obliterate such small irregularities. If, again, there has been definite loss of substance in a wound from sloughing, the scar will be in some measure proportionately thick, and if over a bone probably depressed from contraction towards the bone as the most fixed point.

Besides these propositions there are certain special instances of scars that are very characteristic of how they were produced, amongst which may be enumerated:—

Burns and Scalds.—These are generally large and very irregular, often (in burns at least) showing keloid (thickening of a scar from excessive growth in it) patches or lines. From a large experience the editor is inclined to believe that a scald, of water or tea as opposed to melted metal, which is really a burn, can always be distinguished from

a burn by the peculiar stippled appearance it presents as though the ducts of the various skin glands were still visible on the surface.

Surgical Operations.—These are commonly well indicated by their regular form and situation, and suggest even the reason for their occurrence, amputation, excision, etc.; the marks of the stitches which held them in position can also be usually made out.

Marks of Cupping.—Cupping instruments with their sets of parallel blades are still in very frequent use on the continent of Europe, judging by the great frequency with which the parallel scars are seen on the chests and backs of Jewish immigrants to this country, not in old people alone, but in children as well.

Issues and Setons.—These are very rarely, indeed, seen now, but Dr. Taylor remarked on them: "The cicatrix left by an *issue* ought not to be mistaken for a cicatrix caused by a *seton*. In the first place, it is single, depressed below the level of the skin, and rounded in its margin; and, as in all cases in which the cutis is destroyed, it remains indelible. It is impossible by any process to restore to the skin its uniformity of surface. A *seton* leaves two cicatrices and a hard band of lymph between the two."

Leech Bites are very characteristic, consisting of small triradiate scars corresponding to the shape of the animal's mouth.

Tubercular and Syphilitic Scars are generally much depressed, irregular and thick in parts; they cannot well be distinguished from one another, but they cannot easily be mistaken for the scars of wounds without constitutional disease. The elasticity of the skin, the looseness or density of the cellular tissue beneath, the depression or convexity of the surface and the tension of the muscles, are conditions which will modify the form of the ulcer as well as the cicatrix proceeding from it ("Ann. d'Hyg.," 1840, 1, 430). An expert can seldom do more than distinguish the cicatrices of ulcers arising from morbid causes, from those which have resulted from violence. Cicatrices in the inguinal regions raise a presumption that they are of venereal origin, but it is impossible to say that they may not have been derived from simple abscesses. The old cicatrices of *scrofulous* ulcers have some resemblance to those produced by firearms, but it may be presumed that they are of scrofulous origin when they are situated in the region of the neck, below the jaw, or in the course of the parotid gland, especially when there is any enlargement of the neighbouring glands. A puckered and folded state of the skin around the cicatrix would confirm this opinion.

Vaccination and Small-pox Scars.—The cicatrices left as a result of the application of the true *vaccine* lymph have an irregular honeycombed appearance with white streaks, and are slightly depressed below the level of the surrounding skin. The spurious vaccine mark is of a reddish colour, not depressed, and not presenting the honeycombed appearance and white streaks of the cicatrix of the true pustule. The scars produced by *small-pox* are in the form of deep depressions, showing a complete destruction of the cutis.

Punctured Wounds.—Stabs, bullets, etc., usually leave small puckered cicatrices, from which it is usually impossible to give evidence as to the nature of the weapon inflicting them. It may be asserted that they are usually smaller than the weapon.

There is a word of caution to be expressed in regard to scars in children, viz., that large scars on chest or limbs grow in size with the growth of the child, so that approximately the same proportion of circumference is still involved when the child becomes an adult.

Notwithstanding these circumstances, it is, without other circumstantial evidence, frequently very difficult or impossible to say how the wound of which we have only the scar to examine, was inflicted. If the person is living, he may give a description of the injury and the date of its production, consistent or inconsistent with the appearances presented.

Can a Scar be Removed or so Altered by Time as to be no Longer Recognisable ?—It may be replied at once most positively that no scar can be removed by cutting or excision without leaving another scar behind owing to the loss of tissue. It is thus at once obvious that, as regards *artificial* alteration, it not only can be done but is done intentionally when the new scar would probably be less disfiguring or harmful than the original one. It is quite possible that a criminal or designing person might thus get rid of an inconvenient scar substituting another one for it.

Apart from such artificial procedures, it is certain that the scars of such wounds as have involved a definite loss of tissue are permanent and indelible and last through life with but little change. On the other hand, the scars of small wounds that have healed by first intention may become so indistinct as to require great care in discovery. Caspar states that he has known the linear scars of cupping disappear in three years. Such a case must, however, be very rare: for it is absolutely opposed to ordinary experience, which goes to show that these marks are very permanent. If no mark of cutting can be perceived within a few months of the period at which a severe wound is alleged to have been inflicted, it is reasonable to infer that there has been some mistake, or that the circumstances have been greatly exaggerated.

A case in which this question was raised, was referred to the author under the following circumstances (*Reg.* v. *Reed and Donelan*, Chelmsford Spring Ass., 1842). The medical evidence was to the effect that "there was a wound on the nose of the prosecutrix, apparently inflicted by some sharp instrument, and the bridge of the nose was broken down. The weapon had entered half an inch, and had caused profuse bleeding. The wound was so deep that if it had entered a little higher up in the eye, it might have caused death." In the defence it was urged that no weapon had been used; and that although the male prisoner had struck the prosecutrix a blow, the female prisoner had taken no share in the assault. It does not appear that any medical evidence was called to show in what state the prosecutrix was at the time of the trial. It was assumed that a weapon must have been used, and the prisoners were convicted, the one of stabbing, and the other of aiding and abetting. About six months after the alleged stabbing, and some weeks after the prisoners had been convicted and sentenced to punishment, the face of the prosecutrix was examined by two surgeons (one of them a practitioner of twenty-eight years' standing), and they both deposed that there was no mark of a cicatrix from a stab, of fracture of the nose, or of any

personal injury whatever. Other surgeons were requested to examine the face of the prosecutrix, but this she declined to permit; and as there was no power to compel her, the medical facts of the case were referred to Quain, Guthrie, Key, and the author. The evidence of the surgeons at the trial was laid before them, with the statements of the two surgeons who subsequently examined the prosecutrix. They all agreed that if such a wound as that described in the medical evidence had been inflicted, there would have been a visible scar and a ridge or prominence indicative of the situation where the bridge of the nose was stated to have been broken; and as no such marks could be perceived by two well-informed surgeons, they considered it improbable either that such a wound as that described could have been inflicted, or that a weapon could have been used in the assault. The medical question really to be decided was—could all traces of the cicatrix of such a wound as that above described be effaced in a period of six months, or even during the life of a person? Either the wound must have been misdescribed, or some marks of its past existence in the form of a cicatrix would have been found.

The question of the removal of cicatrices, or rather of what can be done to obviate their results, occasionally comes forward in civil cases where the amount of compensation is to be determined. Thus deformities of the eyelids produced by burns may be occasionally relieved, joints set free, etc., but it is generally held by the judges that a claimant cannot be compelled, or perhaps even expected, to submit himself to an operation to relieve another party of any part of the latter's responsibility. The editor was once engaged in such a case, where an explosion of gas had resulted in severe scars of the face causing ectropion with overflow of tears. The judge ruled that the possibility of relief by a plastic operation was not to influence the jury in awarding damages; a ruling in accordance with the above principle.

Evidence from Cicatrices.

Such being the guiding principles upon which questions regarding scars may be determined, we have now to see how they have been employed in practice. Cicatrices may be imputed. It is rare to hear of frauds of this description: the wound must be made in anticipation at a long date in order to give the appearance of an old cicatrix. It is likely that an impostor may seek to gain his object by attributing the cicatrices of wounds accidentally received to other causes, or by ascribing cicatrices which have resulted from disease to some particular cause occurring in early life. By a remarkable coincidence two persons may have cicatrices on or about the same part of the body, produced by cuts, punctures, or abscesses in early life; and serious mistakes may be made under these circumstances. In 1794, a man named Lesurgues was convicted and executed for murder. There were doubts at the time as to his identity, and strong exertions were made to save his life. Soon after his execution the real murderer was discovered, between whom and Lesurgues, who had had no hand or part in the crime, there existed a wonderful resemblance in stature, complexion, and features. But the most extraordinary part of the case was that Lesurgues, like the real

criminal, had a cicatrix or scar on the forehead, and another on the hand; and there is no doubt that these points of resemblance, which upon a proper scientific examination might have been proved to be really different, became the turning-point of the case and led to the conviction of an innocent person.

On the other hand, an impostor, with old scars upon his person, may make use of them as proofs of identity. Such scars may exist: they may be clearly proved to be of old date, and they may be assigned to causes which cannot be disproved except by a close medical examination. The scars may have arisen from scrofulous ulcers or abscesses, in which case it would not be difficult to distinguish them from the cicatrices of wounds. In the case of *Smyth* v. *Smyth* (Gloucester Sum. Ass., 1853), the plaintiff claimed to be the rightful heir to certain estates held by the defendants. He based his claim upon certain deeds (alleged by the defendants to have been forged), in which it was stated that the lost heir to these estates would be known by certain marks on his right hand and wrist, suggested to have been received at the time of his birth, in 1797, by reason of his having been brought into the world with instruments. It was one of the curious features of this extraordinary case of imposture that no medical opinion was taken or required by the claimant on the probable nature and origin of these marks. When requested at the trial to show his hand to the jury, the mark had the appearance of a puckered cicatrix from a scrofulous ulcer near the wrist. Similar marks from scrofulous sores were seen upon his neck. His statements regarding himself, and the circumstances on which he based his claim, were so improbable and contradictory that the case speedily broke down.

The identity of a person may depend on the presence or absence of cicatrices. At the celebrated second Tichborne trial (*Reg.* v. *Castro*, Q. B., 1873), the possibility of the disappearance of scars was made a matter of great importance as bearing upon identity. Roger Tichborne, the missing baronet, whilst on board the ship *Pauline*, met with an accident by which a fish-hook passed through one eyelid, and had to be pulled through and out; and it was truly alleged that such a wound would leave a scar, and that this would probably be indelible. He had also been bled, an operation which usually leaves indelible scars. It was also certain that, when a lad, Roger had either an issue or seton on his left arm. According to the prosecution it was an issue, and was kept open by a pea. According to the defence it was a seton. On the defendant's arm there was the mark neither of an issue nor of a seton. Moreover, there was no scar on the eyelid such as would have been produced by the fish-hook. Further, Roger had his temporal vein opened when a young man; and there was no scar on the defendant's temples. Although it must be admitted that a venesection mark may disappear in the course of time, it is in the highest degree improbable that several cicatrices such as have been described would all disappear. The defendant was convicted of the attempted imposture, or rather of perjury, in swearing at the first (civil) trial that he was the veritable Sir Roger Tichborne.

In some countries it is the custom to brand convicts, and the cicatrix from the brand-mark—a letter burnt into the skin—is regarded as the strongest proof of identity. In 1828 a man, D., was convicted

of forgery and condemned to the galleys for ten years by the Criminal Court of Brabant. After a short imprisonment he was set free, on the condition that he left the country and never returned. Before his liberation he was examined by Vandelaer, a medical jurist, and he observed that there was upon his arm a cicatrix, or "indelible" mark like that produced by branding. D. went to France, and in 1846 committed forgery and fled the country. The French Government, having reason to suspect that the accused had escaped, and was then living at Brussels under the name of H. B., demanded his extradition. H. B. was arrested, but he denied that he was the person sought for (D.), who had received the conditional pardon in Belgium in 1828. The question of his identity was brought before the Court of Assizes at Brabant. The accused persisted in his denial that he was the man who had been condemned by the Brabant Court for forgery eighteen years before. Several officials of the prison in which D. had been confined at that date came forward, and deposed that there was a strong resemblance in the person now charged to the former prisoner, but they declined to testify on oath that he was the same man. Vandelaer was then required to state whether he could detect on the arm of the accused H. B. the mark, or scar, which he had seen on the arm of D. in 1828. He deposed that there was no mark of a brand on the accused, but at the same time he gave his opinion that the absence of such a mark was not a proof of the non-identity of the accused with D. He assigned as sufficient reasons for its disappearance the length of time which had elapsed, and the probable use of some artificial means to cause its removal. Vandelaer admitted that the mark which he saw on the arm in 1828 had been produced by a red-hot iron, and he thought that such a mark might be partially obliterated by time. Lebeau and Limanges, who were also called as experts, denied the accuracy of this conclusion. Owing to this difference of opinion, the court required reports from the physicians of the prisons of Vilvorde and Gand. They agreed with Vandelaer that a scar or cicatrix made on the shoulder with red-hot iron might disappear after a certain lapse of time, and by the aid of certain means known to convicts. They were therefore not surprised to learn that such a mark, seen in 1828, was no longer visible in 1846. Upon this the court decided that the identity of the prisoner was proved (*Gaz. Méd.*, Mar., 1847).

It will be seen that the medical evidence of identity was here made to rest upon the possible disappearance of a mark from branding with a red-hot iron, after the lapse of eighteen years, without leaving the slightest trace of its existence. This is contrary to experience, and the reasons assigned by the assessors are unsatisfactory. Instead of furnishing any facts to show that such cicatrices from red-hot iron had disappeared within their knowledge, they relied upon the statement of one convict that he had been branded on both shoulders, and the marks had disappeared, and upon the averment of another that he had caused the cicatrix to disappear by the application of a red herring to the burnt part. It would have been a more prudent course to state that there was a want of proof of identity from physical marks. The man, D., may have been the same as H. B., but this was certainly not proved by this negative medical evidence.

At the Cent. Crim. Court in 1834, Carpue was able to rescue a man, who was wrongly charged with being a convict and with having unlawfully returned from transportation. A certificate was produced, dated in 1817, of the conviction of a person, alleged to be the prisoner, under the name of *Stuart*. The governor of the gaol in which Stuart was confined believed the prisoner to be the person who was then in his custody. The guard of the hulks to which Stuart was consigned from the gaol, swore most positively that the prisoner was the man, but he admitted that the prisoner Stuart, who was in his custody in 1817, had a wen on his left hand; and so well marked was this, that it formed a part of his description in the books of the convict hulk. The prisoner said his name was *Stipler;* he denied that he was the person named *Stuart*, but from the lapse of years he was unable to bring forward any evidence. Carpue, who happened accidentally to be present in court, deposed that it was impossible to *remove such a wen as had been described without leaving a mark or cicatrix*. Both hands of the prisoner were then examined, but no wen, nor any mark of a wen having been removed by a surgical operation, was found. The prisoner was acquitted.

A man may allege, in proof of his identity, that at a former period of his life he was bled in the arm, foot, or temporal artery, that he had undergone cupping, or that he had had a seton or issue in his arm. The simple questions for a medical witness will then be—are the marks of bleeding or cupping present? Are they visible in the situations in which such operations are usually performed? And if present, are they such cicatrices as would be likely to result from the alleged operations? If not visible at the time of examination, is it, or is it not, probable that they may have spontaneously disappeared by lapse of time? These simple questions may carry with them momentous issues, either in a civil or a criminal case. With regard to *cupping*, when the operation is properly performed, the numerous small and slightly elliptical cicatrices are well indicated by their whiteness and symmetrical position. The cicatrix left by the use of the lancet in *bleeding* from a vein in the arm or foot, is similar to that of cupping—white, linear, slightly elliptical, with its length in the direction of the vessel, and not across it. Fifty years ago, bleeding was a frequent operation, the same person requiring to be bled at spring and fall. The cicatrix that resulted was always perceptible; in some instances, when the person had been bled in or near the same part of the vein, a hard or knotted white cicatrix was produced, raised above the level of the skin. There is reason to believe that such a mark, involving as it does the whole cutis, very rarely disappears. Beck quotes the case of a child, which had been bled in the right arm when sixteen months old. When nearly four years old the child was lost, and two years subsequently, the godmother, seeing two boys pass, was struck with the voice of one of them; she called him to her, and was convinced that it was her lost godson. The identity was also considered to be proved by the discovery of a cicatrix from bleeding in the right arm, and a cicatrix from an abscess in the left knee, both of which were present in the lost child, and also in the one that was found. The latter, however, had upon his body marks of the small-pox, while no marks of this kind were on the body of the former. The child was claimed by a widow

(Labrie), and many witnesses deposed that it was really her son. The court decided in her favour, chiefly on the ground that the lost child was not marked with the small-pox ("Med. Jur.," vol. 1, p. 655). It was admitted that this child had, on the arm and knee, cicatrices similar to those which were known to exist in the one that was missing; and had the medical witnesses agreed about the causes of them, it is probable that the decision would have been different. The cicatrix on the knee was ascribed to the use of caustics by some of the surgeons, and to a slight tumour or abrasion by others. The widow Labrie admitted that her child had never been bled in the arm, while the missing child had certainly undergone this operation; but on the question of the presence of a cicatrix from bleeding, there was a conflict of medical opinion. Three surgeons examined the cicatrix, and declared that it had been made with a sharp instrument. Others deposed that it was not a cicatrix from bleeding, but from the opening of an abscess. As the child had been missing two years, it might have had small-pox in the meantime. From the medical evidence, the case seems very certainly to have been wrongly decided.

B. Tattoo-Marks.

Small punctured wounds made into the true skin with needles dipped in colouring matter leave marks which may or may not be indelible, according to the mode in which the operation is performed. The subject of tattooing has been noticed by medical jurists. It has been made use of as evidence in cases of disputed identity (Horteloup, *ibid.*, 1870, vol. 2, p. 440; and Casper's "Ger. Med.," vol. 1, p. 115). The colours commonly employed in tattooing are indigo, charcoal (gunpowder), China-ink, and vermilion. Although China-ink and charcoal are black, the effect when introduced into a white skin is to produce with either a blue or bluish-coloured mark. The foreign matter thus introduced mechanically into these minute punctured wounds causes inflammation, but this soon passes off, and the colouring matter then remains permanently encysted in the substance of the cutis, or below it. It has been there found after death.

So far as identification is concerned, tattoos differ materially from scars, for the latter are the result of what may be called accident or the vagaries of disease, and hence multiple scars of identically similar position—formal amputations are perhaps somewhat of an exception—and nature on different individuals are exceedingly improbable. Tattoo-marks, on the other hand, are the result of deliberate intent, and are produced often in many individuals by the same operator—a sailor or soldier, for instance, operating on his comrades—who may from choice or ignorance of other pattern reproduce the same design with endless repetition. Hence two individuals who have been under the hands of the same operator might present tattoo-marks of position, nature, colour, and design so similar as to be practically identical. On the other hand, the editor has seen some designs of the most elaborate and exquisite character produced by an operator in China (a man with a great reputation in the East), and such that they would form a very certain means of identification even if standing alone.

There are two medico-legal questions connected with these marks

which now and again become of great importance: Can they disappear naturally? Can they be removed artificially?

Can Tattoos disappear naturally?—The design itself actually consists of solid (ordinarily insoluble) particles of pigment which have reached, and remained fixed in, the outermost layer of the true skin or (and) just in the deepest layer of all of the epidermis, in the layer, that is, which is never shed bodily, but which keeps on multiplying to provide the more superficial layers. Hence the natural process of disappearance consists in a very gradual process of either conveyance in solution, or bodily convection of these particles into the lymphatic channels of the district, or convection by the daughter cells towards the surface, and therefore the efficiency or permanency depends very materially on the indestructibility and insolubility of the particles of pigment, and on their reaching a situation to which phagocytic cells have ordinarily but little access. Thus it is found that of pigments vermilion and ultramarine have the least resisting power against disintegration and solution, while Indian ink and soot or carbon have the greatest; and the best situation is just below the epidermis in the firmest layer of the true skin. Tidy goes so far as to assert that a design once efficiently (*i.e.*, below epidermis) inserted and made of carbon absolutely never disappears by natural means, and all authorities agree that ten years is the shortest time in which tattoo marks can disappear.

Hence it must be admitted that they are not necessarily indelible. They have, however, been observed to remain for fifty years and upwards. The situation of the marks has also something to do with the rapidity Thus they would naturally disappear more easily from a place, such as the hand, where probably severe friction was of frequent occurrence, than from a place, such as the chest or upper arm, not so likely to be rubbed nor with the same coarse materials as the hands are liable to be.

The editor has repeatedly noted that in tattoo-marks of twenty years and upwards in age the red and blue portions had become very indistinct, while the black portion of the pattern was still to be easily traced.

Can they be removed artificially?—Certainly they can by the application of caustic and blistering fluids to the part or by the actual cautery, but unless such applications are made with great care and gradually the process is almost inevitably bound to result in the production of a scar. The criminal classes are said to be in possession of a method which is kept very secret in its details, but probably consists in alternate applications of caustic potash or soda in solution and of acetic acid; the method is said to leave only very slight traces behind it.

Dr. Felix Brunet in the *Archiv. de Med. Navale* for October, 1898, has gone very fully into the matter. He states that the older methods are very barbarous, but his own certainly does not seem to be lacking in vigour, for it includes vesication by ammonia and the application of nitrate of silver to the raw surface thus produced.

On the occasion of the second trial of the claimant of the Tichborne estates (*Reg.* v. *Castro*, Q. B. 1873), the possibility of the effacement of tattoo-marks became a prominent question. It was well known that the missing baronet had been tattooed along the whole

length of the forearm. The elaimant had no tattoo-marks, nor any signs of tattooing; but above the left wrist there was a large scar, as if a piece of the skin had been cut or burned out. Ferguson and Holt stated that nothing will remove a tattoo-mark short of the knife or a cautery. The man Orton, with whom the elaimant was endeavoured to be identified, was said to have had the letters "A. O." tattooed on his arm. Evidently a elumsy attempt had been made to obliterate the implicating letters "A. O." on the wrist.

20. **Sex.**—Apart from sexual erimes, the identifieation of the sex of any given individual is naturally a very important matter in the ordinary meanings attaehed to the word identity, and it must be considered here, but as the point has other important bearings in legal medieine for which there seems to be no more appropriate place of introduction in this work than the present, it will be discussed fully onee for all in its abstract relationships.

Sex may require to be established positively in one direction or the other for the following reasons:—

1. For purposes of simple identifieation in a living or dead person.
2. For purposes of deciding questions of heirship.
3. For purposes of deeiding whether an individual ean exercise certain civil rights reserved to one sex only.
4. For deciding questions relative to legitimacy, divoree, paternity, and affiliation.

We may consider the evidence that is available in determining sex and discuss its abstract value.

Evidence of Sex.

This may be divided into three eategories: the presumptive, the highly probable, and the eertain. To the first category belong all such points as the features and general eontour of the face and the presence or absence of hair upon it, the length of the hair on the scalp, the clothes, the figure, the habits and inclinations, the voiee, and many other almost intangible minutiæ of everyday experience. To the second category belongs the possession of vagina, uterus, and aceessories, and large breasts in the female sex, structures which are incidental to the needs of the ovum for impregnation, safe protection, development, and nutrition during intra and extra-uterine life; and in the male sex the possession of prostate gland, vesiculæ seminales, and penis, which are accessory to the satisfactory introduction of sperm to germ. The third category eonsists simply in the female sex of the possession of an ovary with ova, and in the male sex of a testicle with spermatozoa.

Presumptive Evidence.—In the ordinary associations of everyday life this is usually, one must admit, accepted as sufficient, but cases in which the sexes change clothes for purposes which range from purely innocent through the mischievous down to the most vilely criminal are very frequent, espeeially in the haunts of prostitution. The deteetion of sueh cases as a rule requires nothing but the ordinary knowledge of the detective or female searcher.

In the following case the condition of the hair gave rise to certain doubts whieh were speedily set at rest:—Chowne examined a woman named Joseph Boisdechine, on behalf of a man who was about to

marry her, but who required a certificate as to the real sex of his intended wife before he entered into a matrimonial engagement. Chowne found nothing in her external conformation indicative of doubtful sex. The breasts were large and full, and the only resemblance to a male was in the abundance of beard and profuse whiskers. The upper lip was free from hair (*Lancet*, 1851, 2, p. 355; 1852, 1, p. 421; 1853, 1, p. 66; *Med. Times and Gaz.*, 1853, 1, p. 71). It is stated that this female was born with a quantity of hair on her chin, and that at eight years of age the beard was two inches long. In old women it is not unusual to see a growth of hair on the chin and lips, but it would not always be safe to rely upon this as evidence of the male sex at any time of life. A Roman countess had so much hair upon her chin that she was obliged to shave like a man. M. C., æt. 42, suffering from mania, was admitted into the Norfolk Asylum, 1865. She had a vigorous growth of hair on the lips and chin, for which depilatories had been used, but these made matters worse. The upper part of the body was masculine in form, and the breasts were undeveloped, as in the male sex. The lower part of the body was feminine in outline, and the voice had the feminine tone and character. The clitoris was largely developed, having a distinct prepuce. There were no testicles in the labia or in the inguinal canals. There was a distinct vagina, and the finger appeared to touch an os uteri. At an early age she had had the slightest possible signs of menstruation on three consecutive occasions. In her girlhood she would not associate with other children. While in the asylum she evinced strong sexual passions, and behaved indecently to the attendants. She had thick moustaches and a full beard (*Lancet*, 1873, 1, p. 129).

Such abnormalities of hair in the female sex are not infrequently associated with sexual malformations.

It is unnecessary to make any very serious allusions to the numerous cases in which, relying on such presumptive evidence, persons have passed through life without suspicion that they were not of the sex supposed. The two following cases are of interest: An unclaimed body was sent to Guy's Hospital by the Inspector of Anatomy as a female. On removing the dress, however, it was found to be that of a *male*. From some suspicion respecting the cause of death and the habits of this person a coroner's inquest was held. It turned out that the deceased, whose age was twenty-four, had assumed the dress of a female at the age of fourteen, and had performed in many parts of England as an actress. The features had a somewhat feminine character; the hair was very long, and parted in the centre; the beard had been carefully plucked out, and the remains of this under the chin had been concealed by a peculiar style of dress. It was remarked during life that the voice was hoarse. The breasts were like those of a male, and the male sexual organs were perfectly developed. They had evidently been subjected to great stretching, and appeared to have been drawn forward and secured to the lower part of the abdomen. The state of the rectum left no doubt of the abominable practices to which this individual had been addicted. It was found that death had taken place from natural causes. The most remarkable circumstance in this case is that the deceased had been attended in his last illness by an eminent physician for disease of the lungs; and so well

was the imposition maintained, that his medical attendant did not entertain a suspicion of the real sex of his patient (*Med. and Phys. Jour.*, February, 1833, p. 168).

A more remarkable case, in which a female had successfully personated a male for many years, occurred in 1865. The case of *Dr. James Barry*, who was well known as Staff Assistant Surgeon and Inspector of Hospitals, is referred to. In the following description the sex is retained under which Barry was known while living. He died in 1865, at the age of eighty, and although suspicions had existed among those who had personally known him that he laboured under some sexual defect, it was only proved after his death that he was really a woman. He is reported to have been the illegitimate child of a nobleman. When, where, and how he passed through his medical studies no one knew, but he contrived to obtain a diploma as Doctor of Medicine from Edinburgh when only fifteen years of age. The young physician entered the army, and served at the Cape of Good Hope, St. Helena, the Ionian Islands, Malta, and the West Indies. Although eccentric, he is said to have displayed on various occasions great professional skill. He was noted for being very quarrelsome, and on one occasion at the Cape he challenged and fought a duel with a brother officer. In due course he retired from the service, received a pension, and was made Inspector of Hospitals. In 1857–8 and subsequently his appearance and manners were effeminate. His face and hands were smooth and white, like those of a woman; he had no beard or whiskers. He was irritable, vain, well informed, and able to talk on most professional subjects in a manner which showed that he had studied them with care. His habits were peculiar. He was a vegetarian in diet, and at dinner ate fruit or vegetables, which he first soaked thoroughly in water in order to remove, as he informed his friends, the animalculæ upon them. He was thin, and in stature resembled a woman, his limbs being small, but in good proportion. His voice was shrill and squeaking, quite unlike that of a man. The impression left upon the mind of all those who saw him was that he laboured under some sexual malformation. After his death, however, it was found that he had the sexual organs of a woman. He had specially desired that no post-mortem examination of his body should be made, but this order was disobeyed, a special report having been ordered by the authorities. It is difficult to comprehend how, in assuming the attributes and duties of an army medical officer, he could have so successfully maintained the deception through a long life. Whether he menstruated or not does not appear. Although always accompanied by a black man as a valet, he was very secret with him, and would not allow him to be present while he was dressing. He is said to have always worn a peculiar and tight-fitting dress.

The Highly Probable and the Certain Evidence.—These two groups of evidence must be considered together with the qualifying remark that in the *living* it is only the highly probable that can be used, while in the dead the absolutely certain can be obtained by means of the microscope (*vide* "Seminal Stains") if necessary.

We have already enumerated the ordinary naked eye points of evidence. In order to understand how doubts can arise about the meaning of what is seen, it is necessary to give a brief outline of the

development of the sexual organs which holds practically throughout the class of animals, known as mammalia, to which human beings belong.

The following table gives the scheme at a glance in condensed form :—

INTERNAL PARTS.

Mass of Germ Epithelium.

Female.[1]	*Male.*[1]
Ovary (?).	Bulk of testicle (?).

Müllerian Ducts (Ducts of Pronephron).

Fallopian tubes.	Their non-union produces the anomalies of uterus bicornis, etc., or double vagina.	Hydatid of Morgagni.
Hydatid.		Uterus masculinus in prostatic urethra.
Uterus and vagina.		

Wolffian Bodies (Mesonephron).

Parovarium.	Vasa efferentia (conivasculosi).
Paroophoron.	Organ of Giraldés, vasa aberrantia.
Round ligament.	Gubernaculum testis.

Wolffian Ducts.

Chief tube of parovarium.	Convoluted tube of epididymis.
Ducts of Gaertner.	Vas deferens and vesiculæ seminales.

Metanephron

Kidney and ureter.	Kidney and ureter.

EXTERNAL PARTS.

Genital Eminence.

Clitoris.	Penis.

Cutaneous Folds.

Labia majora.	Scrotum.

Cloaca.

Rectum.	Rectum.
Vagina.	Connective tissue.
Urethra.	Urethra.

The table may be explained as follows :—At a very early period in fœtal development there is found a single mass of cells at the back of

[1] Organs in the two sexes thus derived from the same fœtal structures are spoken of as analogous organs, and, owing to this similar origin, may by fœtal mistakes in development more or less closely resemble one another each in the opposite sex).

the abdomen. This soon divides into two, one on each side of what will afterwards become the bodies of the vertebræ. From each of these masses is developed a series of glands and ducts, of which the glandular parts remain separate in the form of two testicles or ovaries, two kidneys; the ducts at their upper ends also remain separate as ureters in both sexes, and Fallopian tubes in females. The parts in the male corresponding to Fallopian tubes in the female simply remain as fœtal remnants; the lower ends of two of the ducts, on the contrary, unite and form in the female the uterus, and in the male again a small fœtal remnant. None of these changes in the internal parts, or rather in the parts inaccessible without an operation, are of much interest to the medical jurist with one important exception, and that is the changes of position in the testicles. These should normally lie at the sixth month of intra-uterine life on the psoas muscle, at the seventh month near the internal inguinal ring (a spot on the anterior wall of the lower abdomen), at the eighth month in the inguinal canal, and at the ninth month in the scrotum. If these changes of position do not occur we get the condition known as retained testicle or testicles (cryptorchism), and if both remain actually within the abdomen, the apparent absence of testicles is an approach to the appearance of a female, in which the ovaries are normally in that situation. *Per contra* in the female sex an (or both) ovary is (or are) occasionally drawn down outside the abdomen, and appears in the labium (or labia) majus, thus producing an approach to the male conformation.

Turning now to the external parts, or those accessible to inspection without operation, these are of the greatest interest to the medical jurist in the determination of sex. In the early days of development there appears at the lowest part of the abdomen the genital eminence, which consists of a central prominence with two diverging wings, one on either side, with a wide aperture between these wings. In its very earliest state this aperture is really a common cloaca, into which open both urinary and fæcal outlets. By an ingrowth of tissue the rectum or fæcal outlet is soon separated off, and its anomalies are of interest only to the surgeon. In the anterior division of the cloaca the changes in the two sexes proceed on very different lines. In the male the two diverging wings of the genital eminence unite in the middle line and form the scrotum into which the testicles descend, while from the angle between them grows the penis, with its corpora cavernosa and spongiosa, enclosing the urethra. The remainder of the anterior division of the cloaca grows up entirely into connective tissue, with the exception of the urethra, running the entire length of the penis. In the female the two diverging wings still remain separate, leaving a space between them which constitutes the vagina, the vagina being thus formed out of the middle portion of the original cloaca, and the urethra (as in the male) is a small anterior portion separate from the vagina by an ingrowth of connective tissue. From the angle between these diverging wings grows the clitoris precisely in the same way as in the male, but it does not enclose the urethra, the opening of which is situated just in the middle line behind the clitoris. It will thus be easily seen how mistakes in naming the sex of a fœtus, or new-born infant, may occur. The penis has only to be very small to be precisely like a clitoris, and the clitoris large to be like a penis; the labia majora

have only to unite to present the appearance of a scrotum, and the halves of the scrotum to remain separated to have the appearance of labia majora; and these anomalies have only to be present with internal organs that do not correspond to produce a bewildering variety of forms of real or apparent confusion of sex.

Hermaphroditism should strictly include only a combination of the essential organs (testes and ovary) of generation of both sexes in one individual, but the term as usually understood is enlarged to cover all the above anomalies, and the following varieties are usually enumerated :—

Varieties of Hermaphroditism.

Transverse.—External organs male and internal female, or *vice versâ*.

Vertical or double.
- (*a*) Ovaries with combined male and female passages.
- (*b*) Testicles with combined male and female passages.
- (*c*) Ovaries and testicles co-existing on one or both sides.

It is only vertical (*c*) that is genuine hermaphroditism as understood in the lower animals, *i.e.*, in a strict scientific sense.

To determine the sex, then, of a given doubtful individual, a very thorough examination is necessary both of the external genitalia and of the internal structures to be felt by a bimanual examination. In infants, and adults without definite vagina, the rectum must be used for the purpose. If a solid organ is felt in the pelvis roughly of the shape of a testicle, the only means (in the living subject) there is of determining its true nature is that an ovary (consisting largely of fibrous tissue) is harder, as a rule, than a testicle, which consists mainly of glandular material; if a definite uterus is felt as well, that settles the question in favour of a female, whatever development the external parts may have undergone. If no gland nor uterus can be felt, then the external organs assume greater importance.

The above facts of development constitute the principles which one has to guide one in one's decision. On the one hand, in a male person the lack of union of the cutaneous folds (hypospadias) and lack of growth of the genital eminence proper (the penis), on the other hand, in a female person the excess of union and the excess of growth of the clitoris, constitute in their various degrees the real difficulties.

If the local examination leaves one still in doubt, the other sexual characteristics (they should always be considered) must have the greater weight attached to them, such as the hairiness of the skin in general, more marked in males, the development of the breasts (gynæcomasia in the male is well known to occur), the instinct of the individual for *amours* which must be assumed as inclining to the opposite sex, menstruation, etc., etc., though that these points may all be fallacious is proved by well-authenticated cases of individuals having to change their apparent sex in accordance with medical details even as late as twenty or twenty-five years of age, and that too after sexual indulgence of an inverted character has long been indulged in.

We may now quote a few typical examples of difficulty in determining sex in the living until operation cleared up the matter.

The *Lancet*, 1, 1898, p. 719:—

"*A Case of Spurious Hermaphroditism (Hypospadias and Undescended Testes in a Subject who had been brought up as a Female and been married for Sixteen Years.*

"Cases of spurious hermaphroditism are probably by no means so rare as is often thought, for hypospadias with retained testes gives rise to a condition which is extremely like the female external genitals, and as a consequence these males have frequently been mistaken for females. From the statistics of the French military revising councils 0·5 per cent. of the rejected recruits suffered from this malformation (Lagneau, *Le Bulletin Médical*, April, 1895). It is very difficult to offer any explanation of the occurrence of 'menstruation' in Mr. Clark's patient. The case is remarkable in many respects, and is well worthy of being put on record.

"A woman, forty-two years of age, was recently admitted into Bird Ward on account of a painful swelling in the left groin. She stated that a fortnight previously she was lifting some heavy furniture when something seemed to give way in her stomach; she felt very sick, and had an acute pain in her left groin; on feeling the groin she found a tender swelling there; when she lay down it got smaller, but on her again rising the swelling regained its former size. The severe pain did not last long, and she was able to follow her occupation, but she was always in more or less pain and discomfort, and the swelling seemed to be slowly enlarging, so at the end of a fortnight she deemed it advisable to seek medical advice and went to the hospital. The notes state that on admission she was well nourished and of somewhat masculine appearance. The thyroid cartilage was prominent, she had large hands, and the breasts were well developed, but the nipples were rudimentary, and the areolæ were not marked. There was no hair on the face, and there was but little on the pubes. An ovoid solid body feeling just like a testicle rather above the usual size occupied the left inguinal canal. There was no impulse on coughing, it was dull on percussion, very tender to the touch, and not reducible into the abdominal cavity. A similar but smaller swelling was observed in the right groin; this was not tender, and the patient was not aware of its existence until her attention was called to it. The external genitals were normal in appearance, and the vagina was of normal calibre and length, but the finger introduced into the canal demonstrated a *cul de sac*. No os or cervix uteri could be felt, and a bimanual examination failed to detect the presence of a uterus. The patient had been married for sixteen years, and her husband had died within the last year; she had never been pregnant, and neither she nor her husband had any idea that she was in any way different from other women. She began to menstruate at the age of twelve years, at first not very regularly, but from fifteen to thirty-eight years of age she never missed the catamenial flow every four weeks, and it always continued for twenty-four hours, and no longer; in the interval she had a constant white discharge. There is nothing to note regarding her family or previous history beyond the fact that her mother had told her that when very young she wore a truss for

some time on account of a rupture, but she herself did not remember anything about it. The diagnosis lay between hernia of the ovary and partially descended testicles, for although the patient had lived as a woman and, according to her statement, menstruated regularly, Mr. Andrew Clark could not put from his mind the idea that these bodies were testicles. There were no urgent symptoms, and she said she expected her menses shortly, so she was kept under observation for about a fortnight, but as during this period there was absolutely no change in her condition, and there was no sign of the menses appearing, there seemed to be no reason for waiting any longer before operating. Accordingly the patient was placed under ether, and an incision two and a half inches long was made over the left swelling, the sac was opened, and what were to all appearances an ordinary testicle and spermatic cord were drawn out of the wound.

"*Remarks by Mr. Andrew Clark.*—'I would first remark that there was no doubt about the nature of the organs removed. They have been carefully examined, and both were in structure identical with the testicle; no spermatozoa were, however, found. I have called the patient "she," though, as far as we were aware, she had none of the essential generative organs of the female, but having always lived as a woman, I did not think it necessary or even fair to inform her of what we had discovered, and when she left the hospital she believed, as far as I am aware, that she had been suffering from an ordinary rupture which had been cured. There are many cases of hernia of the ovary on record, and in the account given of some the suggestion of the supposed ovary being a testicle is made, and there are some in which when the bodies have been removed they have proved to be testicles; but in all these cases, as far as I know, the individuals have not menstruated, been married, and lived to the age of forty-two years in ignorance of their condition. There was no evidence that this person was a hermaphrodite, there was no uterus, at any rate not large enough to be felt, and there was no evidence of ovaries. I cannot account for the regular menstruation, but I am inclined to take the statement regarding that *cum grano salis*, for there was absolutely no opening to the vaginal tube. I consider that the patient was really a man with a very ill-developed penis in a condition of hypospadias.'"

The *Brit. Med. Jour.*, 1, 1902, p. 541:—

"*Hermaphroditism: Sex detected at an Ovariotomy.*

"Surgeons are now well aware that an ovarian hernia must be looked upon with suspicion, as the 'ovary' has more than once turned out to be a testicle, even when a rudimentary uterus was discovered. Hence the genital tract should be always explored before and during an operation on a hernia where a body diagnosed as an ovary lies in the sac. Krabbel, of Aachen,[1] records a remarkable case. A teacher in a high school suffered from an abdominal tumour. 'He' was a splendidly built, short 'man,' with a moustache and a less developed beard. The voice was high, the larynx not prominent, and the breasts flat. The abdomen was distended by a large tumour. There was a distinct

[1] "Ueber eine seltene Ovariotomie," Report of Meetings of the Cologne Obstetrical Society, *Monats. f. Geb. u. Gyn.*, February, 1902.

penis, but showing extreme hypospadias, no scrotum, and no testicles, whilst two well-formed labia existed. Under chloroform a small vagina and a cervix were detected. Ovariotomy was performed; the tumour was a multilocular cyst of the left ovary; a small body resembling an ovary which lay attached to its under-surface proved to be the parovarium. There was a well-made though small uterus, with a right as well as a left broad ligament, though nothing is reported about a right ovary. One year and a half later a large recurrent growth was removed. Professor Marchand pronounced it to be a teratoma with sarcomatous and myomatous tissue added to the complicated and highly developed structures seen in this kind of morbid growth. No recurrence has taken place, and the patient remains in good health. No emissions nor catamenia had ever occurred. Of course the patient was in this case an undoubted female, but hypospadias, undescended 'testicles,' and even a distinct rudimentary vagina are no proof of sex, whilst, as said above, a male—that is, a testicle-bearing person—may possess a rudimentary uterus. The nature of the genital gland, in Krabbel's case a cystic ovary, can alone determine disputed sex."

The *Lancet*, 2, 1902, p. 148:—

"*A Case of Vertical or Complex Hermaphroditism with Pyometra and Pyosalpinx; Removal of the Pyosalpinx* (*by E. Percy Paton, M.S. Lond.*).

"The case of which the notes are given below is, I think, of sufficient general interest to be put on record.

"A patient, aged twenty years, came under my care at the Mildmay Mission Hospital, Bethnal Green, on March 17th, 1902. He was complaining of very frequent and painful micturition and thickness of the urine and some tenderness over the bladder. On examination he was found to be a double cryptorchid and to be hypospadiac, the hypospadias being of the perineal variety; the penis was very poorly developed and only between two and three inches long; there was a depression in the glans at the normal seat of the meatus, but this opening was blind, and the whole of the floor of the penile urethra was wanting, the urine being discharged by an opening in the perineum which admitted a No. 10 catheter with ease. On either side of this opening were two folds of skin representing the split scrotum, but the folds were empty, there being no signs of testes to be found here or in either inguinal region. Extensive scarring was to be seen on the right side of the hypogastric region, which the patient said was due to an abscess which had been opened about a year before, and which had now been closed for about six months. Beneath this scar there was to be felt an ill-defined fulness, the nature of which could not be clearly made out, partly on account of its tenderness and partly because of the scarring. The person was operated upon, and an examination of the parts removed gave the following results. The tube had in every respect the ordinary structure of a Fallopian tube, somewhat dilated so as to contain about a drachm of pus, in which no organisms were demonstrated by ordinary staining or by staining for tubercle bacilli. The gland showed in one part a structure which there could be no doubt was that of a rudimentary testis, as ill-formed tubercles could be

very clearly seen; in another part of the section there was a mass of cells of which the nature was uncertain. These cells varied in shape, being mostly cubical and round cells and some short spindles, but there were none like ovarian cells; possibly they were derived from the original cells of the germinal epithelium.

"*Remarks.*—In this case the following seems to be the condition of the sexual organs. Externally the penis was small, but otherwise normal except for the fact that the urethra had no floor. What appeared to be the opening of the urethra was really the opening of a very rudimentary vagina, into which the uterus opened by a fair-sized aperture, and the urethra by a very small one; the folds on either side of the opening in the perineum might be taken to be either rudimentary scrotum or labia. Internally there were a very fairly well-formed uterus and tubes, and on the left side the gland, which was removed, was clearly a testis; it was uncertain if there was a similar gland on the right side. There was no evidence of the existence of epididymis, vas deferens, or prostate, but it was quite possible that these might be present in a rudimentary form, as no examination to settle this point could of course be made. The bladder was normal save for considerable increase in size. The general build of the individual was rather of the female than of the male type. The above-mentioned points would lead one to classify the case according to Simpson's classification,[1] as one of true double, vertical, or complex hermaphroditism, in which part of the internal organs are of the male and part of the female type."

The *Lancet*, 1, 1901, p. 1790, reported by J. Thomson Shirlaw:—

"I was asked to prescribe for a girl, aged twenty years, who had never menstruated. As, however, I did not care to do this without previous examination, I obtained the necessary consent. I then found that the vagina ended in a *cul de sac*, and in making this examination the knuckle of my index finger came against a swelling in one labium. I then exposed and found two fully developed testes, one in each labium majus, and each in a sac of its own. They were freely movable, and there was testicular sensation. The clitoris was an inch long. The genital hair did not extend on to the abdomen, but was limited to the pubes. The mammæ were small and poorly developed, although larger than in the male. The patient was tall and slight, with a coarse voice, and suffered now and again from hysteria and 'ovarian tenderness,' for which she had been blistered. There was sexual orgasm. It may be also mentioned that her brother has a harelip."

The *Lancet*, 1, 1900, p. 1884, case reported by Mr. R. G. Turner:—

"The frequency of cases of true hermaphroditism is probably not great, but the statistics of the French military revising councils show that a cleft of the scrotum causing an appearance of two labia is met with in about five per thousand of all those rejected. The increase of the intertubular tissue of the testis (noticed in the following case) is mentioned in several of the cases in which the testis of a hermaphrodite has been examined microscopically after having been removed. We refer our readers to an annotation entitled 'Marriage between Persons of the Same Sex' which appeared in the *Lancet* of June 23rd,

[1] Sir J. Y. Simpson's Works, vol. 2.

p. 1814, and which illustrates the extreme difficulty of diagnosis of sex in some of these cases.

"A 'girl,' aged fourteen years, had been 'ruptured' ever since birth. She had worn a truss until she was twelve years of age, but since then nothing in the way of a support. She had been in early life under the care of a surgeon to a truss society who had wished to operate. She is the third of a family of six who are all well developed. She had never menstruated. On admission to St. George's Hospital there was a movable oval irreducible swelling in the left inguinal region, which was taken to be a prolapsed ovary. This was removed, and proved to be a testis lying over the external abdominal ring. The cord was ligatured, and the ring was closed by suture. The operation wound healed by first intention. The naked eye appearance of the organ removed was that of a well-developed testis, the epididymis of which contained three little cysts. A microscopical examination was made by Dr. H. D. Rolleston, and showed that there was no ovarian tissue; there were seminal tubules like those of the testis. In addition there were masses of interstitial cells like those seen in the testis of some of the lower animals.

"Gas and ether were subsequently administered to allow of a thorough examination of the individual by Dr. W. R. Dakin and Mr. G. R. Turner. The mammary glands were both well developed for the patient's age. The pubic hair was scanty, but the external parts were those of a well-developed female, the labia majora, minora, clitoris, and urethral orifice being normal. The latter was slightly caruncular. The vagina admitted the index finger half-way up to the second knuckle. The width of the vagina was normal; it terminated in a *cul de sac*. No cervix uteri could be felt. A very small transverse cord, like a Fallopian tube or vas deferens, could be felt per vaginam. Nothing could be felt in the labia. On bimanual examination a transverse cord could be felt to slip away. This cord was situated one inch behind the pubes. Per rectum the whole pelvis could be explored. There was nothing found—nothing to represent either the uterus or prostate gland. The following were the pelvic measurements: interspinous, $8\frac{3}{4}$ inches; intercristal, $9\frac{5}{8}$ inches; and external conjugate, $6\frac{3}{8}$ inches.

"*Remarks by Mr. Turner.*—'This case would appear to be one of true hermaphroditism, in which the external organs of generation are like those of the normal female, the vagina ending in a *cul de sac* with no trace of uterus or ovaries. The inguinal testicle (now in the museum of St. George's Hospital) had all the naked-eye appearance of the normal except that the epididymis was the seat of cystic degeneration. Microscopically, too, the structure was testicular. A somewhat similar case is recorded by Dr. Chambers in the Transactions of the Obstetrical Society of London, vol. 21, p. 256. In that case, too, the orifice of the meatus urinarius was irregular and granular; the vagina was an inch long; and there was no trace of hymen, uterus, or ovaries. There were present two testicles, the glandular structure of which had never undergone its normal development. Leopold records a similar case, and Hauf made a post-mortem examination on one in 1873. In Shattock's case of spurious hermaphroditism with cleft scrotum and extreme hypospadias (Lagneau, *Le Bulletin Médical*, April, 1895), both testes were removed in the course of a radical cure

for double inguinal hernia. It is interesting to note that in these testes, as in the one removed from my patient, there was a "highly pronounced group of interstitial cells in the stroma." I have been unable to discover any marked inclination to either of the sexes in my patient. "She" has been brought up as a girl, and acts as nurse to her younger relatives.'"

Lancet, 2, 1899, p. 28, report of Edinb. Obstetr. Soc.:—

"The President read a paper on two cases of mistaken sex in adult life. The individuals had been brought up till over twenty years of age as females, and he was consulted owing to the absence of menstruation. On examination under chloroform it was found that they were both cases of peno-scrotal hypospadias. Dr. Croom discussed the difficulties attending such cases, both legal and social, pointing out by illustrative cases the complications which arise when the exact sex is overlooked at birth. He further discussed Neugebauer's recent paper on the subject."

These could easily be multiplied, but they are quite sufficient to show how difficult the question of sex may be when it is required to be answered for purposes of heirship or exercising civil rights, supposing that the person for whom it is necessary to determine a sex is not dead, and will not submit to an operation. We may now consider the medico-legal relationships of the matter under the headings enumerated.

Sex in Simple Identity need not be further considered here, but *vide supra*.

Sex in Heirship.—Lord Coke has stated that, according to the law of England, a hermaphrodite may be either male or female, and it shall succeed according to the kind of sex which doth prevail. Thus it is obvious that the law will decide each case according to the special circumstances attending it, but it must not be supposed that the decision is so easy as Coke's doctrine would imply. There are many cases in which neither sex can be said obviously to prevail. Sexual monstrosity is not a ground for depriving a being of the rights of inheritance, except under peculiar legal conditions. Thus a right of succession or inheritance to landed estate may depend upon the *sex* of the offspring, as where, for instance, two children are born, the first a hermaphrodite, the second a well-formed male child. The parents die, and a title of nobility or lands may fall to the first-born male. Here the sex of the first-born must be determined before possession can be had. In a case of this kind, if medical evidence should establish that male peculiarities predominate in the first-born, the second child would be cut off. Again, if an estate were limited by entailment, as where it is settled upon heirs (male or female) of a particular family, the birth of a hermaphrodite, an only child, would create the legal necessity for a positive determination of the predominance of sex. So if a hermaphrodite live but a few minutes after birth, and then die, the rights of persons may be subsequently much affected by the medical attendant having come to an opinion respecting its sex. Since we cannot determine under what circumstances litigation may ensue, it is always right in a doubtful case to observe the sex, and make notes on the spot when a child thus malformed survives its birth but for a short period. The question of tenancy by courtesy, or the right of the husband to landed

estates of which the wife was seised, will depend entirely upon the attention of the accoucheur to this point (see "Tenancy by Courtesy"). Of course, if such a child die, post-mortem examination will easily clear up the sex or decide that both are present.

Sex in the Exercise of Civil Rights confined to one Sex only.—So far as the editor is aware, such a question has never been before the English courts of law, but the following case, which occurred in America, might presumably occur here under similar circumstances. At an exciting and warmly contested election in the United States of America in 1843, almost everything bearing the semblance of the human form of the male sex is stated to have been brought to the ballot-box. It was at this time, and under these circumstances, that Levi Suydam, aged twenty-three years, a native of Salisbury, Con., was presented by the Whigs to be made a free*man;* he was challenged by the opposite party, on the ground that he was more a female than a male, and that in his physical organisation he partook of both sexes. There was a mons veneris, covered with hair in the usual way; an imperforate penis, subject to erections, about two and a half inches in length, with corresponding dimensions; the dorsum of the penis was connected by the cuticle and cellular membrane to the pubis, leaving about an inch and a half free, or not bound up, and towards the pubic region. This penis had a well-formed glans, a depression in the usual place of the outlet for urine, with a well-defined prepuce. The scrotum was not fully developed, inasmuch as it was but half the usual size, and not pendulous. In the scrotum, and on the right side of the penis, there was one testicle, of the size of a common filbert, with a spermatic cord attached. In the perineum, at the root of the corpora cavernosa, an opening existed through which micturition was performed; this opening was large enough to admit the introduction of an ordinary-sized catheter. Having found a penis and one testicle, although imperfectly developed, Barry, without further examination, gave it as his opinion that the person in question was a *male citizen*, and consequently entitled to vote and enjoy all the privileges of a free*man*. On the morning of the election day, Barry was informed that Ticknor would oppose this person's admission on medical grounds. Suydam came forward; and Ticknor objected to him as a *female*, and therefore not entitled to vote. Barry then stated to the meeting that, from an examination he had made, he considered the person in question to be a male; and requested that Ticknor might, with the consent of Suydam, retire into an adjoining room, and examine him for himself. This was done, when Ticknor ultimately came to the conclusion that this person was really a male. He was accordingly admitted a free*man*, and his vote was received and registered. A few days after the election Barry heard that Suydam had regularly menstruated as a woman. His sister informed Barry that she had washed for him for years, and that he menstruated as regularly, but not so profusely, as most women. When questioned, he very unwillingly confessed that such was the fact. He was again examined by the two physicians, when the following additional particulars were elicited:—Said Suydam was five feet two inches in height, light-coloured hair, fair complexion, with a beardless chin and decidedly a sanguineous temperament, narrow shoulders, and broad hips—in short, every way of a feminine figure. There were

well-developed breasts, with nipples and areolæ. On passing a female catheter into the opening through which micturition was performed, and through which he again stated he had a periodical bloody discharge monthly, instead of traversing a canal and drawing off urine, the catheter appeared to enter immediately a passage similar to the vagina, three or four inches in depth, and in which there was a considerable play of the instrument. He stated that he had amorous desires, and that at this time his inclination was for the male sex. His feminine propensities, such as a fondness for gay colours, for pieces of calico, comparing and placing them together, an aversion for bodily labour, and an inability to perform the same, had been remarked by many. Barry further learned from an old lady who was present at the birth of Suydam that on the second day after his birth Delamater, who attended as accoucheur, made with an instrument the opening through which he had ever since performed micturition (*Amer. Jour. Med. Sc.*, July, 1847, p. 123).

This was certainly an embarrassing case, one to which Lord Coke's rule for a decision, *i.e.* the prevalence of either sex, is hardly applicable. The presence of a penis and one testicle referred the being to the male sex, while the bodily configuration, and still more strongly the periodical menstrual discharge, referred him to the female sex. The right of voting might have been fairly objected to, because, while the female characters were decided, the organs indicative of the male sex are described as having been imperfectly developed.

Sex in Divorce, Legitimacy, Paternity, and Affiliation.—In such cases as these the question of the actual determination of a definite sex is of comparatively little moment compared with the questions, Is this person physically incapable of procreation, whether as active or passive agent? Is the malformation such as to justify divorce on the ground that the person is incapable of proper sexual intercourse? Could this person possibly be the father or mother of this child?

Thus Tardieu has reported a case of suit for nullity of marriage, of which the following are the particulars :—

"This being was married as a woman at the age of twenty-five. Her husband lived with her for more than two years before he took steps for a separation. It then turned out that the physical conformation of this person rendered a consummation of the marriage impossible. The wife was found to have no organs essential to the female sex. There were neither breasts, vagina, uterus, nor ovaries. The pelvis was more like that of the male than of the female, and although then twenty-seven years of age, the being had not menstruated, and had not suffered from any periodical lumbar or abdominal pains. With the exception of the conformation of the pelvis and the absence of breasts, there was no male development. As, on the one hand, there was an absence of vagina and uterus, and on the other of penis and testicles, it may be fairly said that this being had no sex. The wife was able to obtain from her own physician a medical certificate that she was of the female sex, and this led to some difficulty in reference to the suit of nullity. The difficulty was removed by Tardieu and Courty. Their conclusions were that she had only partially the appearances of the female sex. The most striking of these, width

of the pelvis, was absent. She was not only impotent by reason of the absence of a vagina, but permanently sterile, inasmuch as there was every reason to believe that the internal female organs were absent or in a rudimentary state. The person must be placed among those monstrous subjects in which there is, properly speaking, no sex, and which cannot therefore enter into a marriage contract with either a male or a female."

Such cases seldom come before our English courts, and are still more seldom reported with any details, though the cases already reported might of course appear in court; the individuals in question would almost without exception be both impotent and sterile, and yet there is no reason why any of them that have survived infancy should not live to a marriageable age, and even enter the state of marriage in ignorance of the real state of affairs.

Where the sexual organs are simply double the person possessing them need not necessarily be either impotent or sterile, and there are numerous cases on record in which women with double vagina and uterus have been impregnated and borne children.

When these beings have reached adult age, other questions may arise with respect to them. The English law does not allow them to select their sex, but determines it for them by medical evidence. Hermaphrodites, or sexual monsters, were formerly ranked with infamous persons; and it has been a grave question in our courts whether the calling a man a hermaphrodite was not such a libel or slander upon him as to render it a ground for a civil action. In a case reported by Chitty ("Med. Jur.," p. 374), the use of this term was held not to be actionable, unless it was proved that it had been attended with special damage. A dancing-master brought an action against a person for calling him a hermaphrodite, and it was decided that it was not sustainable—(1) because such a union of the sexes cannot exist in fact, and every one must be supposed to know it: consequently the assertion could not be supposed to prejudice; (2) because, admitting the possibility of such a double function, the party would be just as good, and perhaps even a safer, dancing-master than if only one perfect sex had been discoverable: consequently the words would not, in legal presumption, injure him in his profession or occupation.

Hartshorn quotes a case in which an attempt was made to destroy all sexuality, and thereby all rights of citizenship, in an infant whose sexual organs were imperfect (*Amer. Jour. Med. Sc.*, October, 1852; *Edin. Month. Jour.*, January, 1853). The child was three years of age, and had always up to that period been regarded as a girl, and in fact had been so pronounced at her birth by the accoucheur. At the age of two years she began to evince the taste, disposition, and feelings of the male sex; she rejected dolls and similar articles of amusement, and became fond of boyish sports. She was well grown, perfectly healthy, and quite fleshy. Her hair was dark and long, the eyes black, and the whole expression most agreeable. A careful examination of the external genitals disclosed the following circumstances:—There was neither a penis nor a vagina; but instead of the former there was a small clitoris, and in place of the latter a superficial depression or *cul de sac* covered with mucous membrane, and devoid of everything like an aperture or inlet. The urethra

occupied the usual situation (in the female?) and appeared to be natural; the nymphæ were remarkably diminutive, but the labia were well developed, and contained each a well-formed testicle quite as large and as firm as this organ generally is in boys at the same age. The hips, chest, thighs, and upper limbs were perfect. From this description it is pretty clear that the child was an *androgynous; i.e.*, there was imperfect development of the sexual organs, with predominance of those of the male. There was no indication of uterus or ovaries, nor any external peculiarity, except that which is frequently met with in hermaphrodites, in which there is an arrest of male development, but no intermixture of the sexes. It was considered that, for the child's future welfare and happiness, it would be better that it should have no testicles at all than that it should retain them under such an imperfect development of the other organs. They were therefore removed by operation from the labia or divided scrotum, and they were found perfectly formed in every respect, and the spermatic cords were quite natural. Three years subsequently it was found that emasculation was complete, for the disposition and habits of the being had materially changed, and were those of a girl: she was found to take great delight in sewing and housework, and she no longer indulged in riding on sticks and other boyish exercises.

The reasons assigned for the performance of this operation—namely, the entire deprivation of sex, and thereby of any sexual feelings in after-life—appear to be unsatisfactory. It is clear that this being was deprived of the rights and privileges of a *male* by the removal of the testicles. In this country it might have been a question whether the operator had not rendered himself liable in damages.

The determining of the sex by a proper examination at the time of birth, and the making a note thereof, is a special duty of the accoucheur. To find that at birth children are pronounced to be girls, and turn out in after-life to be boys, is not creditable to a member of the medical profession who is supposed to possess sufficient anatomical knowledge.

21. Hair.—The hair in identification is a tolerably obvious point under ordinary circumstances, but as it can be artificially altered by dyeing, etc., and as also it is very resistant to the ordinary agents of putrefaction, many medico-legal questions may arise concerning hair, and the subject may be here dealt with in all its aspects to avoid repetition.

Hair as a Factor in Identification.

This is a matter principally of colour, character, and length.

Colour in its natural state offers but little means of positive identification beyond the bare fact that the hair on the dead body is of the same colour as that which was remembered of the person who is missing. The different shades of colour (reds, browns, whites, and yellows) are indeed very numerous, but they are nothing compared with the number of individuals in the world. It may of course happen that there may be something very peculiarly striking in the colour of the hair of a corpse either in its totality or in some special little patch of it (the editor knows of at least one case in which a peculiar lock of white hair in the midst of a head of fine dark hair

forms a most definite and striking point of peculiarity or identification of the individual), and in a limited population, such as a small town or village, such a point might become of almost overwhelming corroborative importance if the age and other points were approximately those of the individual known to be missing.

But the colour may be artificially altered, and the medical jurist must be acquainted with, at least, the commoner means employed for such purposes, and how they may be detected. The means employed are of two broad classes: (*a*) substances applied to the hair which by their presence *conceal* the colour; (*b*) substances which *alter or destroy* the colour, dyes. Amongst the former lampblack to obtain a black colour, and flour, chalk, etc., mixed with some greasy substance to obtain a white colour, are those most commonly used; these are very easily detected by washing the hair in simple water or brushing it in water, when the particles will be removed more or less completely, and may be observed in the water with the eye, or may be looked for with simple chemical tests, though the object is not so much to find out the nature of the substance as the fact of something having been applied. The latter (dyes) are a little more difficult to detect, but the fact of a dye having been used is usually suggested by one or two simple observations. Thus (*a*) it will commonly have been applied to the hair of the head only, the pubic and other hair having been left untouched. (*b*) If it has not been applied very recently the bases of the hairs will show a short length of the natural colour by growth since the application. (*c*) The microscope will generally show that the dye has left small spots and patches untouched, the trunk of the hair showing different colours. (*d*) The skin of the scalp or face may also show the application of such a dye as walnut juice or other vegetable dyes. Bleaching dyes, such as chlorine and peroxide of hydrogen, used to produce golden locks, have a tendency to destroy the structure of the hair and make it very brittle, and hence may be detected by the frayed condition. Lead and bismuth are the two common metals used for dyeing purposes. If they are suspected, the hair may be digested with strong nitric or nitrohydrochloric acid, and the resultant liquid tested for those metals. It is not difficult as a rule to decide whether the hair has or has not been dyed.

Character.—There are many characters of hair which may serve as corroborative points in identity either of a person or of a given individual hair, but they are mainly those denoting the race from which the person came. The curly short crisp hair of the Negro, for instance, is well differentiated from the hair of any European race; the straight lank hair of most aborigines is much coarser than hair of similar straightness occurring in more civilised races. Information derived from mere similarity of the way in which whiskers, beard, and moustache are worn, is of very little value when standing without very strong corroborative evidence.

Length.—This of course gives nothing more than a suggestion in a case of an unknown person. A man may let his hair grow, and a woman may cut hers short. It may be of some little importance to determine whether the hair in question has its natural length, or whether it has been artificially shortened by cutting; the microscope will easily detect the difference. If of natural length it *may* be possible

to suggest its origin, eyebrow, scalp, pubes, etc., but this would at the best be of little use as legal evidence without comparison (*vide* below).

Can the hair grow after death?—On this Tidy remarks: "That both the hair and nails may grow for a time after death has been proved by careful observations. Good (who records cases in proof), Pariset, and Villermé, in the French Dictionary of Medical Sciences (the former of whom gives a remarkable instance), and Bichat (who states he has himself noticed a lengthening both of the beard and of the nails after death), are authorities in favour of post-mortem growth, whilst Haller contends that the cases where the hair has appeared to grow after death are in reality deceptive, and due merely to a shrinking of the skin. Still that there may be molecular life and fecundity of the epidermis and therefore of the hair follicles for a time after somatic death is what theory would lead us to expect, and observations are ample in proof." He then quotes the following case: "Dr. Caldwell, of Iowa, states that he was present in 1862 at the exhumation of a body which had been buried for four years. He found that the coffin had given at the joints, and that the hair protruded through the openings. He had evidence to show that the deceased was shaved before burial; nevertheless the hair of the head measured 18 inches, the whiskers 8 inches, and the hair of the breasts 4 to 6 inches." A case will be found also in the Section on "Decomposition."

Hair as a Factor in Criminal Evidence.

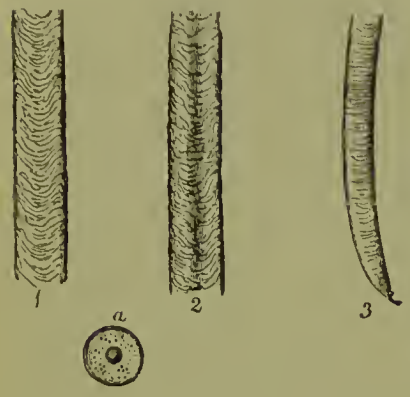
In this connection hair may assume a position of overwhelming importance. The questions that a medical witness must be prepared to try to answer are—(1) Is the object submitted for examination hair or some other substance? (2) If hair, is it human or from some other animal? (3) If human, from what part of the body did it come?

1. Is this hair or something else?—In examining any blood clot or small mass of mud from boots or articles of like nature, the substance must be digested and broken up in water, so that any possible fibres may be separated, and so easily noted by naked eye or a simple lens. If a boot or any weapon is submitted for examination, it must be scrutinised closely by the naked eye and with a lens all over, but especially any of the unevennesses in general contour—junction of haft and blade, notches on blade, cracks in boot nails, junction of nail with leather, hooks or lace holes, etc., etc.; and any sort of visible fibres must be carefully extracted by forceps or maceration in water, and submitted to microscopical observation. A very high power is not necessary. Generally speaking, one-sixth of an inch objective is sufficient, or one-eighth at the highest. Any object to be thus examined should be soaked in oil of turpentine and mounted in Canada balsam. This procedure is advisable for two reasons: (*a*) that the object can be better seen in varying lights, and its structure observed; (*b*) the preparation becomes a permanent one, which can be kept for any length of time for purposes of comparison. As we shall see later, *comparison is the basis of such evidence.*

The following description of hair is taken from Schäfer's "Essentials of Histology," 4th ed., p. 132: "The substance of a hair is mainly composed of a pigmented horny fibrous material, which can be

separated by the action of sulphuric acid into long tapering fibrillated cells, the nuclei of which are still visible. This fibrous substance of the hair is covered by a layer of delicate imbricated scales termed the hair cuticle. In many hairs, but not in all, the centre is occupied by a dark-looking axial substance, the dark appearance arising from the presence of minute air bubbles, which cause the hair to look white by reflected light. The root has the same structure as the body of the hair except at its extremity, which is enlarged into a knob composed mainly of soft growing cells, fitting over a vascular papilla which projects upwards from the bottom of the follicle."

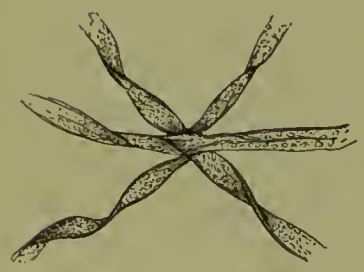
Fig. 8. Fig. 9. Fig. 10.



The appearances above described are seen in the woodcut, fig. 8. In fig. 9 the central core is shown; in figs. 8, 9, and 10 only the hair cuticle is shown; this resembles somewhat that of wool, but hair is more uniform in width: (*a*) represents a transverse section of a hair showing the medullary air cells in section. Fig. 10 shows the pointed extremity of a hair from the eyebrow.

The substances which are likely to the naked eye to be mistaken for hairs are fibres of the common stuffs for clothing—cotton, hemp, silk, and wool. When examined under similar powers of the microscope to those suggested for hair, cotton presents itself as a flattened band, assuming more or less a spiral form (fig. 11). The fibre of linen derived from flax is of a rectilinear form, with jointed markings at

Fig. 11.



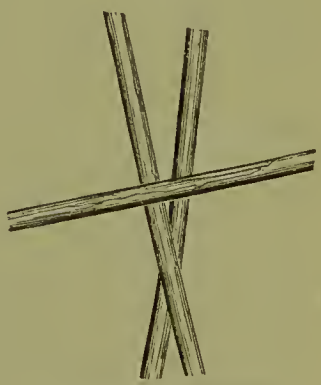
Fibres of cotton, magnified 300 diameters.

Fig. 12.



Fibres of linen, magnified 300 diameters.

Fig. 13.



Fibres of silk, magnified 300 diameters.

unequal distances, the fibre tapering to a point (fig. 12). Silk and woollen have other characters by which they may be identified. Silk presents a regular cylindrical form, and there are no markings upon the surface. It has a strong refracting power on light, which gives to the fibre a well-defined boundary. The fibre of woollen is irregular,

contorted, of unequal thickness, and it has peculiar markings of an imbricated character on the surface. This may be taken as the type of cloth, shoddy, alpaca, merino, and a variety of other fabrics worn as clothing. The microscopical characters of these fibres under certain circumstances are long retained, so that they may be identified after many centuries. Fig. 15 represents the woollen fibre from the shroud of a monk buried in an ancient priory in the fourteenth century, and exhumed within a recent period after the lapse of five hundred years. The markings are simply less defined than in the recent sample of wool. The fibres are also of a coarser and larger kind. The fibre of linen appears to be equally indestructible. Fig. 16 represents fibres from the linen cerements of a mummy, of the dynasty of the Shepherd Kings. It was unrolled in 1832. This fibre was well preserved, and was still tough. The ancient woollen was rotten, and broke into small fragments. The linen had the characters of the fibre of modern flax. It was of a very coarse fabric, and was strongly

Fig. 15.

Fig. 14.



Fibres of woollen, magnified 300 diameters.



Fibres of ancient woollen, magnified 300 diameters.

Fig. 16.



Fibres of ancient linen, from an Egyptian mummy, magnified 300 diameters.

impregnated with a brown bituminous matter used in embalming. Its preservation was no doubt in great part owing to the presence of this substance. These illustrations have been drawn from average specimens, under the same power of the microscope, so that they are calculated to give an idea of the relative size of the fibres. (See Linde's "Beiträge zur gerichtl. Chemie," p. 45, 1853.)

Other fibres are frequently found upon weapons, boots, and articles of dress. These are common vegetable fibres from roots, leaves, and other substances. They cannot be confounded either with hair or with the four sorts of fibres just described. Dr. Stevenson was once called upon to examine the boots of a man who was supposed to have murdered a woman by kicking her on the head. The woman had very grey hair; and on the front of the prisoner's boot was a small dark spot, which was supposed to be blood; and embedded in this were a couple of white hair-like bodies. The brown spot was composed of vegetable matter, and the white "hairs" were the down of a thistle.

If it is hair is it human hair?—The hairs of animals are frequently found on weapons and clothing; they must not be

confounded with human hair. They are, generally speaking, coarser, shorter, thicker, and less transparent than those of a human being. The hair of some animals may be at once distinguished by the eye or by a pocket lens, as that of the cow, the horse, and the deer; but the hair of some dogs, such as the Skye-terrier and spaniel, being long and silky, closely resembles that of man. The linear markings on the cortical portion are not so numerous or fine. Fig. 17, No. 5, is the hair of a spaniel magnified 300 diameters. By measurement it had a diameter of the ·00089 inch. No. 6 is the hair or fur of the rabbit, ·00089 inch, No. 7 the hair of the hare. These hairs have a remarkable structure in the form of dark transverse cells. This kind of hair is found in all rodents, *e.g.* the rat, the mouse, and the squirrel. No. 8 is the hair of the horse, ·0029 inch; No. 9, of the goat, ·002 inch; No. 10, of the fox, ·0017 inch; No. 11, of the cow, ·0017 inch; No. 12, the hair of the fallow deer, ·004 inch in diameter. The mere difference in size among these hairs is not to be regarded as a marked distinction, for in the same animal hairs of very different

Fig. 17.



sizes may be found, and human hairs vary very much in diameter from 1·360 of an inch to as little as 1·600. The engravings above given have been copied from actual measured specimens. They are all represented under the same magnifying power, *i.e.* 300 diameters. The cells and linear markings on the cortical portion furnish the most striking differences. In Hamilton's "System of Leg. Med." (New York, 1900, p. 187) will be found further drawings of hairs and fibres.

Besides this microscopical evidence of appearance all the other characters of the hair must be considered, its length for instance, dyed or not, has it been cut or shaved? etc., all of which have a distinct bearing on the identity of human *v.* animal hair; and, above all, the medical jurist before going into the box must obtain a specimen of the alleged hair and compare it with that which has been submitted to him.

If human from what part of the body did it come?—Comparison with hairs of known situation is here absolutely essential. It is of no use whatever to state that the hair of the eyebrow and eyelash is stouter than that of the head, nor that the hair of pubes and axillæ is again stouter than that on the rest of the body. Stoutness is typically a matter of comparison.

In examining hairs microscopically it will be well to observe

whether they are of the same or of different colours or sizes, whether they are pointed at one end or cut at both ends, and whether they have still attached to them the bulb or sheath in which they grew. This condition of the hair will be found when it has been violently torn from the skin. The microscope will sometimes enable a medical jurist to state whether a hair has been indented, cut, or bruised, at either or both ends; the medullary structure frequently retains these marks of violent treatment. (See Casper's *Vierteljahrsschrift*, January, 1863, p. 76.) A spermatozoon or other body might possibly be found adhering to a hair. All these matters may under a favourable concatenation of circumstances help in deciding where a hair came from; the seat of a blow might, for instance, be known, and a hair on a blunt weapon when compared with another from the same seat of injury may show similarity or not. But without such points of comparison it would be unwise in the extreme, if not worse, to swear to the precise locality from which a hair came. The law of multiple evidence by many points of agreement here receives another typical illustration.

The following cases illustrate the above points very well.

The importance of examining closely the hair found on weapons is shown in a case in which a hatchet, having clotted blood and hair adherent to it, was produced as evidence against an accused person, under whose bed this weapon had been found. This, with other circumstantial evidence, had turned public opinion strongly against the prisoner; but when the hair was examined it was found not to be human, but to have been taken from the body of some animal. The circumstance led to a more complete sifting of the evidence, and the accused was acquitted. It turned out that the accused had killed an animal with the hatchet, and had carelessly thrown the weapon under the bed ("Apology for the Microscope," p. 24). In *Reg.* v. *Hansen* (Bodmin Lent Ass., 1856), the weapon by which the deceased lost his life was a heavy stone found near the dead body. The base of the skull was fractured, and there were upon the stone marks of blood with some hair similar to that of the deceased. The prisoner was connected with the act by his having been seen with the stone, or one closely resembling it, in his possession. On these and other circumstances he was convicted.

The necessity for an acquaintance with the characters of hair will be apparent from the case of *Teague* (*Reg.* v. *Teague*, Cornwall Sum. Ass., 1851, p. 504), and of Watson (*Reg.* v. *Watson*, see below). In *Teague's Case* it was alleged that the fatal wounds to the head of the deceased, involving both eyebrows, had been produced by a hammer found in a hedge. There was no blood on the hammer, but there were two short white stiff hairs at the smaller end. It was suggested that these might have been the hairs of a white goat, the hammer having been used for beating out portions of goat-skin which were hanging on the same hedge. Two medical witnesses, however, deposed that they were hairs from a human eyebrow, and having compared them with the deceased's eyebrow, they found they agreed. The hair of the eyebrow was described as conoidal or pyramidal; and the hair on the hammer had this character. It appeared as if it had been bruised or squeezed between two blunt substances, but this appearance might have been equally presented on the theory of the defence that it was goats', and not human, hair. The medical evidence pointed to the weapon, and not to any act on the part of the prisoner. The witnesses were severely cross-examined upon the structural differences of the hair of man and animals (*Med. Gaz.*, 1851, 48, 731).

It may easily occur to a medical jurist that on some occasions this kind of evidence may be of importance in showing that the hair is similar to or different from that of the assailant or deceased. An opinion of identity based on a similarity of hairs found on a weapon or on a person who has died from violence should be expressed with caution. The hair of a woman is generally longer and finer than that of a man, and the hair in children is finer and more silky-looking than that of an adult. But there are many persons who have hair similar in colour, size, and length; hence a witness may be able to say that there was similarity, but he can rarely be in a position to swear that there is absolute identity. In *Reg.* v. *Devine*

(March, 1864) the deceased was killed by blows with a poker. On the end of the weapon, which was traced to the prisoner, some grey hairs were found, corresponding to those of the deceased. In a case of murder and suicide which occurred at Somers Town in July, 1864, Harley found on a hatchet certain hairs from one to three and a half inches long, which he described as human hairs from the head of a fair person who was becoming grey. From their fineness he considered them to be hairs from the head of a woman, and when compared with those taken from the head of the deceased woman (Rosetta Bishop), they presented so great a similarity as to leave no doubt that the hair had belonged to the same person, and that the wounds on the head had been inflicted with this hatchet. As in other cases of contused wounds on the head, there was no blood upon the hatchet. The presence of hairs on a weapon under these circumstances proves that it has not been washed, or they would not be found; and if with the hairs there is no blood, then it follows that these could not have been stained with blood from the wound. This absence of blood is, however, quite consistent with the production of contused wounds from which blood may have subsequently escaped in large quantity.

The discovery of the hair of animals may sometimes have an important bearing on a case, as in *Reg.* v. *Watson and wife* (Notts Lent Ass., 1867). The prisoners were charged with the murder of a man named Raynor. He was seen going into the prisoners' house, and about two hours afterwards his dead body was found lying across a line of railway below it. Twenty minutes before the body was discovered a person had passed the spot, and the body was not there. The medical evidence showed that death had been caused by manual strangulation. There were marks of bruises about the head. The face was smeared with blood, and blood had escaped from the nose, but there was no wound by cutting, and no great blood-vessel had been injured. No hat could be found. There were marks of dragging between the cottage and the line of railway, and at the part in the soft clay there were the impressions of footmarks corresponding to the boots of the male prisoner. On the top bar of a gate there were marks of blood. On searching the house an iron rake was found concealed on a shelf, with a cindery substance adhering to one end of it, looking as if it had undergone fusion. On heating a portion of it the smell of burnt shellac was emitted, and on acting on it with alcohol a resinous solution like that of shellac was obtained. The alcohol caused the separation of some fibres which under the microscope proved to be the hair of some rodent animal. The short fibres were mixed with irregular flakes of shellac only partially destroyed. On being questioned respecting the rake the male prisoner said he himself had used it on the Friday (the day before the murder) for cleaning out a cesspool.

A hat similar to that worn by the deceased, and purchased at the same shop, was burnt. The cindery ash was collected, and submitted to examination with precisely similar results. These hats are made of felt, chiefly from rabbits' and hares' fur, and this is mixed with shellac.

The theory of the prosecution was that deceased had been killed by the prisoners in their house; that they had afterwards taken an opportunity of dragging the dead body from the cottage to the railway, and had laid it across the rail, with a view of its being run over by an expected train and concealing the murder. The train then due was late that day, and the body was discovered and removed by the porter before it had passed. Where was the hat of the deceased? It was a worthless article, which no one perpetrating murder would have stolen, to be perhaps a proof against him, and yet no hat was found with the body. It was suggested for the prosecution that in dragging down the body the hat was accidentally left in the cottage. To have returned with it to the railway might have led to detection. It was assumed that the prisoners had burnt it under the grate in order that it might not be evidence against them, and that they used the rake in the process by pressing it together, and thus some portion of the half-burnt felt still adhered to the flat end of the rake.

It was suggested in the defence that the rake might have been used for the burning of a hat a long time previously, and that the burnt shellac or resin adhering to the rake might have been used by somebody for making varnish. According to the statement of one of the prisoners, the substance found on the rake could not have been there more than twenty-four hours, *i.e.*, within the time which included the murder of Raynor. Admitting that shellac or resin is used in making varnish, rabbits' fur is not so employed, and it was necessary to account for the

presence of both of these substances on the rake. There was no evidence to show that there had been varnish-making and the burning of rabbit-skins in this cottage within twenty-four hours of the death of Raynor. The only conclusion to be drawn from the facts was that some one for some purpose or other had within the time mentioned burnt in the prisoners' cottage a hat similar to that worn by the deceased, and that the prisoners knew nothing of the proceeding.

22. **Age.**—The establishment of the age of an individual has so many important medico-legal bearings that it must be fully discussed, after which we may consider the questions that may arise. Inasmuch as even the very earliest embryos may have a bearing on the chastity of a woman, it is necessary to commence at the time at which an embryo can be distinguished, although the early products of conception have more connection with evidences of pregnancy and abortion than with identity.

It will then be convenient to discuss the evidences of age in periods:—

1. The age of an embryo up to six months.
2. The age of a child between six months' intra-uterine life and full term.
3. The age of a child recently born.
4. The age of a child that has survived birth more than a day or two, or of an adult.

Age of Embryo up to Six Months.

The following description of the first six months' development is taken from Galabin's "Midwifery," 4th ed., 1897, slightly abridged:—

"*First Month.*—At the end of the third week the diameter of an ovum is two-thirds of an inch, the length of the embryo one-sixth of an inch; the amnion is formed; the embryo's back is curved, and the enlargement of its cephalic extremity marked. At the end of the fourth week the greatest diameter of the ovum is about seven-eighths of an inch, its weight about forty grains; the length of the embryo is about one-third of an inch; the eyes, the ears, and the visceral arches are distinguishable. Four bud-like processes mark the commencement of the limbs. The umbilical vesicle is manifest, but smaller than the embryo. The amnion is not much distended and separated by an interval from the chorion.

"*Second Month.*—At the end of the second month the ovum is about one inch and three quarters in its greatest diameter, and the embryo three quarters of an inch long. The umbilical vesicle is very small, and hangs by a withered thread. [The limbs are more manifest, but there is as yet no separation of upper and lower segments of the limbs.—Ed.] Points of ossification have appeared in the lower jaw and clavicle. The mouth and nose are manifest. The Wolffian bodies have atrophied, and the kidneys have appeared.

"*Third Month.*—At the end of the third month the ovum is about four inches long, the placenta is formed, and the rest of the chorion has to a considerable extent lost its villosity. The cord has now become long relatively to the fœtus, and already shows its spiral twist. The fœtus is four to four and a half inches long, and weighs about 450 grains. The head is separated from the body by the neck, and the oral from the nasal cavity by the palate, and the mouth is

closed by the lips. The sexual organs have appeared, but the penis and clitoris are scarcely distinguishable. The limbs are developed, including the fingers and toes, and a first appearance of formation of nails can be detected. Points of ossification have appeared in most of the bones.

"*Fourth Month.*—At the end of the fourth month the fœtus is, on an average, about five and a half inches long, and weighs about three ounces. The sex can now be distinctly recognised. The bones of the skull have partly ossified, but still have very wide fontanelles and sutures. There is a slight commencement of the formation of down on the skin. *Movements of the limbs have commenced; but these may, however, be detected in a freshly expelled embryo even before the end of the third month.*

"*Fifth Month.*—The fœtus is, on an average, nine inches long, and weighs nearly eleven ounces. Hair has appeared upon the head, and lanugo or down over the whole body. The skin begins to be covered with vernix caseosa.

"*Sixth Month.*—The fœtus is, on an average, about twelve inches long, and weighs about twenty-four ounces. The eyebrows and eyelashes are beginning to form. Subcutaneous fat is commencing to be deposited, but only in small degree, so that the skin is still wrinkled. There is a yellowish material in the small intestine, and there may be a commencing appearance of the darker meconium in the large intestine. The hair on the head is longer and less like down."

For further particulars the reader is referred to special works on embryology. An excellent one is H. Keith's "Human Embryology." Accurate woodcuts illustrating the above descriptions will also be found in Keith.

In reference to the terms here employed, the "ovum" signifies the embryo *and* its membranous coverings; the "embryo" is the body which is afterwards converted into the fœtus; "fœtus" is the name applied to the embryo after the third or fourth month of gestation.

The great difficulty will consist in determining the nature of the supposed ovum or embryo between the second and third months. In making the examination, the substance should be placed in water, and all coagula gently washed away or removed by some blunt instrument. Alcohol may be used as a substitute for water after the blood has been removed. If the embryo cannot be found, the decidua and chorion, or portions of them, may be recognised, the former by its forming the outer investment, with its smooth internal and rough external or uterine surface; the latter by the villous or shaggy appearance of that portion of it which would have become the placenta. Between the third and fourth months the fœtus may be commonly identified without much difficulty. The ovum in many instances escapes first, leaving the decidua behind. This comes away after a time, but it is important to remember that, in some states of the virgin, decidua-like structures are shed from the uterine mucous membrane, which, when examined by the microscope, are like the true decidua. Both are constituted of the innermost portion of the uterine mucous membrane, and contain all its elements. It requires a skilled microscopist to distinguish placental tissue with certainty.

Such are the principal points we have for determining the age of the contents of the uterus in the early stages of pregnancy.

We have taken the first six months as a convenient period, because of the fact that there is no case on record in which a child of certainly not more than six months' uterogestation has permanently survived its birth, but it must be admitted that the medico-legal questions arising out of the age of a given fœtus are much the same whether under or over six months.

The points themselves are of such a nature that, while it is easy to decide between extremes, it is quite impossible to draw hard and fast lines between say the second and third months and between the third and fourth; and these are precisely the cases in which lawyers will attempt, in defence of a woman's chastity, to obtain an opinion, when, for instance, the last possible date of connubial connection is five months ago, and a fœtus is born which might be of three, four, or five months' development. Cross-examination of him who asserts that it could not be the result of a husband's embrace will always be very severe, and the woman will be given the benefit of any possible doubt. This is not to be wondered at either on the score of justice, or on the ground of the ordinary law of variability in development shown by fœtuses. The only rule which a medical witness can here safely adopt is to fix reasonably wide limits and say the fœtus must be between these limits and leave the decision to other evidence and to the jury.

With regard to the question of live birth in such immature fœtuses *vide* "Live Birth."

AGE BETWEEN SIX MONTHS AND FULL TERM, NINE MONTHS.

The following description of the child between six and nine months corresponds very closely with those in most text-books on midwifery :—

"*Between the sixth and seventh months.*—The child measures, from the vertex to the sole of the foot, from ten to twelve inches, and weighs from one to three pounds. The head is large in proportion to the trunk; the eyelids are adherent, and the pupils are closed by membranes (membranæ pupillares). The skin is of a reddish colour, and the nails are slightly formed; the hair loses the silvery lustre which it previously possessed, and becomes darker. Ossification proceeds rapidly in the chest-bone, and in the bones of the foot; the brain continues smooth on its surface, and there is no appearance of convolutions. In the male the testicles will be found in the abdominal cavity, lying upon the psoas muscles immediately below the kidneys.

"*Between the seventh and eighth months.*—The child measures between thirteen and fourteen inches in length, and weighs from three to four pounds. The skin is thick, of a more decidedly fibrous structure, and covered with a white unctuous matter (vernix caseosa) which now first appears. Fat is deposited in the cellular tissue, whereby the body becomes round and plump; the skin previously to this is of a reddish colour, and commonly more or less shrivelled; the nails, which are somewhat firm, do not quite reach to the extremities of the fingers; the hair becomes long, thick, and coloured; ossification advances throughout the skeleton; valvulæ conniventes appear in the small intestines; and meconium is found occupying the cæcum and colon.

The testicles in the male are considered about this period to commence their descent,—or rather, the child's head being downwards, their ascent,—towards the scrotum. The time at which these organs change their situation is probably subject to variation. According to Hunter, the testicles are situated in the abdomen at the seventh, and in the scrotum at the ninth, month. Burns believes that at the eighth month they will commonly be found in the inguinal canals. The observation of the position of these organs in a new-born male child is of considerable importance in relation to maturity, and it may have an influence on questions of legitimacy as well as of child-murder. Curling thus describes their change of position :—'At different periods between the fifth and sixth months of fœtal existence or sometimes even later, the testicle begins to move from its situation near the kidney towards the abdominal ring, which it usually reaches about the *seventh* month. During the eighth month it generally traverses the inguinal canal, and by the end of the ninth arrives at the bottom of the scrotum, in which situation it is commonly found at birth' ('Diseases of the Testis'). Its absence from the scrotum does not necessarily indicate that the child is immature, because the organ sometimes does not reach the scrotum until after birth, and sometimes not at all (*vide* "Cryptorchism").

"*Between the eighth and ninth months.*—The child is from fifteen to sixteen inches in length, and weighs from four to five pounds. The eyelids are no longer adherent, and the membranæ pupillares have disappeared. The quantity of fat deposited beneath the skin is increased, and the hair and nails are well developed. The surface of the brain is grooved or fissured, but presents no regular convolutions; and the grey matter is not yet apparent. The meconium occupies almost entirely the large intestines; and the gall-bladder contains some traces of a liquid resembling bile. The testicles in the male may be found occupying some part of the inguinal canal, or they may be in the scrotum. The left testicle is sometimes in the scrotum, while the right is situated about the external ring.

"*Ninth month: Signs of maturity.*—At the ninth month the average length of the body is about eighteen inches, and its weight from six to seven pounds. The male child is generally rather longer, and weighs rather more than the female. Extraordinary deviations in length and weight are occasionally met with. Galabin states that children are sometimes born mature and survive which weigh less than five pounds. On the other hand, Dr. Waller, in the Obstet. Trans., records one weighing 18 lbs. 15 ozs., while lengths of twenty-four and thirty-two inches are also recorded. The period of gestation for children of unusually large size is the same as that for children of average size. According to Duncan, the length and weight of the child vary according to the age of the mother. They are greatest among children when the mother is from twenty-five to twenty-nine years of age. When a woman is twenty-five, the child weighs less. The child of a woman at twenty-two weighed 7 lbs. 3 ozs., and that of a woman at thirty 7 lbs. 7 ozs. The length varied in a less degree, being, for the different ages, at or about nineteen inches" (*Edin. Month. Jour.*, December, 1864, p. 500), for further records of big children *vide B. M. J.*, 2, 1903, p. 36.

A point of ossification is found in the lower epiphysis of the femur.

Casper placed great stress on the presence of this point of ossification in the lower epiphysis of the thigh-bone (femur) in its bearings upon the maturity of the fœtus. This point usually first makes its appearance at the 36—37th week; at the 37—38th week it is commonly the size of the head of a house-fly; and at the full period it is of one-fourth to one-third of an inch in diameter. When this point of ossification is one-third of an inch in diameter, it may be confidently affirmed that the fœtus has reached the full period; but where the point is only one-fourth of an inch in diameter it cannot be positively asserted that the child is mature, though it is probable that such is the case.

At the full period the head of a child is large, and forms nearly one-fourth of the whole length of the body. The cellular tissue is filled with fat, so as to give considerable plumpness to the whole form, while the limbs are firm, hard, and rounded; the skin is pale; the hair is thick, long, and somewhat abundant; the nails are fully developed, and reach to the ends of the fingers—an appearance, however, which may be sometimes simulated in a premature child by the shrinking of the skin after death. The testicles in the male are generally within the scrotum. Ossification will be found to have advanced considerably throughout the skeleton. The surface of the brain presents convolutions, and the grey matter begins to show itself. The internal organs, principally those of the chest, undergo marked changes, if the act of respiration has been performed by the child before, during, or after its birth (*vide* "Infanticide").

The relative position of the point at which the *umbilical cord* is attached to the abdomen has been considered by some medical jurists to furnish evidence of the degree of maturity. Chaussier thought that in a mature child, at the ninth month, the point of attachment of the cord exactly corresponded to the centre of the length of his body. Later observations, however, have shown that this is not quite correct. Out of five hundred children examined by Moreau, the navel corresponded to the centre of the body in *four* cases only. In the majority of these cases, the point of insertion was eight or nine lines below the centre. Among the cases of mature children which the author had an opportunity of examining, the navel has generally been situated from a quarter to half an inch below the centre of the body (Guy's Hosp. Rep., 1842, p. 23). Moreau found, on the other hand, that in some children, born about the sixth or eighth month, the cord was attached to the middle point of the length (*Lanc. Franc.*, 1837). On the whole, it will be perceived that no great value can be attached to the situation of the navel as a sign of maturity or immaturity.

The characters which have been here described as belonging to a child at the different stages of gestation must be regarded as representing an average statement. They are, it is well known, open to numerous exceptions, for some children at the ninth month are but little more developed than others at the seventh; and in some cases a seven months cannot be distinguished with certainty from a nine months child. Twins are generally smaller and less developed than single children; the average weight of a twin child is not more than five pounds, and very often below this. The safest rule to follow in endeavouring to determine the uterine age of a child is to rely upon a

majority of the characters which it presents. That child only can be regarded as *mature* which presents the greater number of the characters found at the ninth month of gestation.

If the age of the child has been determined, whether it be under or over the seventh month, the rules for a further investigation will be the same. Should the child be under the seventh month, the medical presumption will be that it was born dead; but if it has arrived at its full period, then the presumption is that it was born alive.

Trötsch has pointed out that the size of the external ear furnishes a good test of the age of the child, and Dr. Stevenson has confirmed his observations. Trötsch measured both the length and breadth of the external auricle, but it usually suffices to take the greatest length only. The following are the usual extreme lengths of the external ear in the fœtus :—

5 months . . .	0·31 to 0·47 inch.
6 ,, . . .	0·55 to 0·67 ,,
7 ,, . . .	0·63 to 0·96 ,,
8 ,, . . .	1·02 ,,
9 ,, . . .	1·02 to 1·10 ,,
After birth . . .	1·30 to 1·42 ,,

It is convenient to remember that the length of the child in inches is, during the later stages of pregnancy, about double the intra-uterine age in months.

Conclusions.—The following may be taken as a summary of the principal facts upon which our opinion respecting the uterine age of a child may be based :—

1. *At six months.*—Length, from nine to ten inches; weight, one to two pounds; eyelids adherent; pupils closed by pupillary membranes; testicles not apparent in the male.

2. *At seven months.*—Length, from thirteen to fourteen inches; weight, three to four pounds; eyelids not adherent; pupillary membranes disappearing; nails imperfectly developed; testicles not apparent in the male. There is a point of ossification in the astragalus.

3. *At eight months.*—Length, from fourteen to sixteen inches; weight, from four to five pounds; pupillary membranes absent; nails perfectly developed, and reaching to the ends of the fingers; testicles in the inguinal canal. Points of ossification are found in the last sacral vertebra.

4. *At nine months.*—Length, from sixteen to twenty-one inches; weight, from five to nine pounds; pupillary membranes absent; head well covered with fine hair; testicles in the scrotum; skin pale; the finger nails well formed and reaching to the ends of the fingers; features perfect: these and the body are *well developed* even when the length and weight of the child are less than those above assigned. There is a well-developed point of ossification in the lower epiphysis of the femur.

5. The point of attachment of the umbilical cord, with respect to the length of the body, affords no certain evidence of the degree of maturity.

Or in tabular form—

	6 *months.*	7 *months.*	8 *months.*	9 *months.*
Length . . .	9 to 13 ins.	12 to 15 ins.	15 to 17 ins.	18 to 20 ins.
Weight . . .	1 to 2 lbs.	2 to 4 lbs.	4 to 5 lbs.	5 to 8 or 9 lbs.
Skin	Red and wrinkled.	Paler and smoother.	Paler.	
Fat	No subcutaneous fat.	Fat beginning to be deposited.	Child plump.	
Scrotum . .	Empty.	—	Corrugated.	Occupied by testes.
Testes . . .	On psoas muscle	Near the internal ring.	In canal.	In scrotum.
Sex	Well differentiated.			
Hair	Lanugo and vernix casoosa.	Scalp hairy with lanugo.	—	Hair on scalp an inch long.
Eyelids . . .	Adherent.	Non-adherent.	Well formed.	
Brain . . .	Sylvian fissure formed.			
Intestine . .	Meconium in small intestine.	Meconium in large intestine.		
Centres of ossification . .	Manubrium and os calcis.	Astragalus.	—	Lower epiphysis of femur.

The Age of a Child recently Born.

We have now to deal with a different class of age data to those we have hitherto considered. These have been entirely directed to proving either that a child could or could not have been *the* child of particular parentage, or that it was or was not capable of extra-uterine manifestations of life. We have now to consider for how long it has acted on that capability, and we assume that there is definite evidence of some duration of life. Under Infanticide will be found all there is to be said upon evidence bearing upon this assumption.

Changes in the Lungs, whether of the nature of atelectasis or of full respiration, and changes in the arrangements of fœtal circulation will not very much help us here, though they may be of great importance in deciding live birth (*q.v.*). We have mainly to rely upon changes in the umbilical cord and changes in weight and stature in endeavouring to determine the age of a new-born child, and it must be admitted at once that none of them nor all of them yield very decisive indications.

Changes in the Umbilical Cord.—These are certainly the least untrustworthy of any data we have, the reason for which is that the changes themselves are due to vital processes, and are governed by laws which are fairly well known, and which pursue a fairly regular course. Thus when the cord is tied and severed in the usual way the portion left adherent to the body begins to dry up in from twelve to twenty-four hours, and in about twenty-four hours from birth a ring of inflammation makes its appearance round the site of its insertion. This inflammatory redness must not be mistaken for a thin red circle which is almost constantly present at birth. By about the third or fourth day the drying of the cord is complete, and the dried portion separates from the navel about the fourth or fifth day, leaving an

ulcer, which takes from seven to twelve days to completely heal. Hence, if a child is found with well-marked inflammation or an ulcer at the umbilicus, a very reasonable approximation may be made to the time that it lived after birth, though even here the different rates at which wounds heal in healthy and unhealthy children must render the judgment somewhat tentative.

There is one extremely important point to be noted with regard to the drying of the cord, which is this: if a child has lived say two or three days, long enough, that is, for the cord to appreciably mummify, no amount of soaking in water will cause a *restitutio ad integrum* in the dried parts. This statement has been made by medical jurists, but during 1904 the editor made many experiments with cords of all degrees of dryness, and he was compelled to the conclusion that the statement is much too positive. A dried cord swells up, and, except for being a little darker, is hardly to be distinguished from one that had not dried before soaking (*vide* "Infanticide"). Children's bodies at this age are frequently thrown into water, and in all such bodies thus recovered a dried piece of cord tells an unmistakable tale of at least two or three days' life.

Weight.—If we consider the extreme limits from say five pounds up to nearly nineteen pounds for the weights of new-born children and then remember that we have no means of knowing what the weight of an unknown found child was at birth, it will be at once seen that the absolute weight of a child found dead is of no use whatever in estimating how long it lived if it is probable from other reasons that it was not more than a few days old. It is worth noting that for the first two or three days even healthy children lose weight (Tidy).

Height.—Precisely the same reasoning applies to the height of a new-born child. The extremes are too variable, and therefore the initial basis for comparison is not available.

Dr. Taylor wrote on this subject as follows, and with his opinions the editor may be said to be in general accord:—

"If we suppose it has been established that a child not only lived, but was actually *born* alive, it may be a question whether it lived for a certain number of hours or days after it was born. The answer to this question may be necessary in order to connect the deceased child with the supposed mother. It has been remarked that scarcely any appreciable changes take place at ordinary temperatures in the body of a living child until after the lapse of twenty-four hours; and these changes may be considerably affected by its degree of maturity, healthiness, and vigour. The following may be taken as a summary of the appearances observable in the body of a child that has survived its birth for the undermentioned periods:—

"1. *After twenty-four hours.*—The skin is firm and less red than soon after birth. The umbilical cord is somewhat shrivelled, although it remains soft and bluish-coloured from the point where it is secured by a ligature to its insertion in the skin of the abdomen. The meconium may be discharged, but a green-coloured mucus is found on the surface of the large intestines. The lungs may be more or less distended with air, although in a case of survivorship for a period longer than this no trace of air was found in them. With regard to the state of the lungs, it should be remembered that when these organs

are fully and perfectly distended the inference is that the child has probably survived many hours; but the converse of this proposition is not always correct. Several cases already reported show that when the lungs contain a small quantity of air it does not follow that the child must have died immediately after it was born.

"2. *From the second to the third day.*—The skin has a yellowish tinge; the cuticle sometimes appears cracked, a change which precedes its separation in scales (Devergie, vol. 1, p. 519). The umbilical cord is brown and dry between the ligature and the abdomen.

"3. *From the third to the fourth day.*—The skin is more yellow, and there is an evident separation of the cuticle from the skin of the chest and abdomen. The umbilical cord is of a brownish-red colour, flattened, semi-transparent, and twisted. The skin in contact with the dried portion presents a ring of vascularity or redness, gradually shaded off towards the abdomen. Geoghegan met with this appearance in two cases of still-born children, and the author saw it in four cases in which the children were born dead (Guy's Hosp. Rep., 1842, p. 23). The colon is free from any traces of green mucosity.

"4. *From the fourth to the sixth day.*—The cuticle in various parts of the body is found separating in the form of minute scales or of a fine powder. The umbilical cord separates from the abdomen usually about the *fifth day*, but sometimes not until the eighth or tenth day. The membranous coverings become first detached, then the arteries, and afterwards the veins. If the umbilical aperture is cicatrised and *healed*, it is probable that the child has lived for three weeks to a month after birth. The ductus arteriosus may be found contracted both in length and diameter; the foramen ovale may be also partly closed.

"5. *From the sixth to the twelfth day.*—The cuticle will be found separating from the skin of the limbs. If the umbilical cord was small, cicatrisation will have taken place before the tenth day after birth; if large, a sero-purulent discharge will sometimes continue to escape from it for twenty-five or thirty days. The ductus arteriosus is said to become entirely closed during this period; but this statement is open to exceptions, which have been elsewhere pointed out. The body rapidly increases in size and weight when the child has enjoyed active existence.

"On the whole, it will be seen that the signs of survivorship for short periods after birth are not very distinct. There is commonly no difficulty in determining the fact after the second day. The changes stated to take place in the umbilical cord during the first twenty-four hours may be observed in the *dead* as well as in the living child, and the other changes occur with much uncertainty as to the period. These are, however, the principal facts upon which a medical opinion on such a subject can be based; and it is in some respects fortunate that great precision in assigning the time of survivorship is not demanded of medical witnesses.

"It is expected that a medical man will be able to distinguish between a new-born child and one which has been born for several days, and evidence on this subject is occasionally required in reference to supposititious children. Those who attempt a fraud of this kind have sometimes been compelled to substitute a child two or three days

old for one just born. A medical man called in to a woman after an alleged delivery in the presence of a nurse (perhaps an accomplice) is bound to exercise great caution. In the event of litigation at a subsequent date, he is expected to be able to inform a court of the condition of the child when first seen by him and of the probable date of its birth. He will not be allowed to throw the blame of a mistake upon others. The temporary success or the failure in perpetrating a fraud of this kind will depend upon his observation of the facts.

"A medical man cannot be too careful in noticing upon the body of the child any characters which may serve as proofs of identity. He must remember that the defence may be that the child is not that of the woman charged with murder. This observation applies especially to the examination of the bodies of children that may have survived their birth for some days. The body may be found wrapped in paper, or in some article of clothing which may help to establish identity. If the child has survived its birth, it would be proper to form an opinion for how many days. In addition to these points, the sex of the child and the colour of the hair should be noted, as well as any particular marks on the skin (mothers' marks), and, of course, all wounds or other injuries, their cause or mode of production, and their situation.

"At the Maidstone Lent Ass., 1868, a case of some difficulty arose respecting the identity of a child alleged to have been murdered (*Reg.* v. *Ward*). The dead body of a child which had evidently survived its birth was found wrapped in clothing, and concealed near a high-road, by which the woman charged with murder had been seen to pass on a certain day. The surgeon who examined the body thought that, from the state of it, the child had been dead a month, but he was unable to give any opinion of the cause of death. There was evidence that the child of the prisoner had disappeared when it was about a fortnight old.

"It was contended in defence that the child whose body was found was not that of the prisoner. The child found, as well as that of the woman, was of the male sex, and had light hair; but the age formed a difficulty. The child of the prisoner must have been at least fifteen days old at the time of its death, while the surgeon considered that the body found was that of a child not more than ten days old. The prisoner upon this evidence was acquitted."

The editor leaves this case in as a warning to others of the legitimate limits of medical evidence. When a child has been lying putrefying for a month, and has so far decomposed that the cause of death cannot be estimated, to suppose that it would still yield evidence of so fine a point as whether it were ten or fifteen days old, is on the face of it most absurd; and if this were the only point of defence the prisoner must consider herself to have been very lucky.

Estimation of Age in a Child that has survived Birth some Weeks at least, possibly Months.

In the absence of documentary proof, the estimation of the age of a *living* child must be a very loose one until it arrives at the time when dentition commences. The height and weight may again, as in new-borns, afford some little assistance, but it must be remembered

that there is a tremendous difference in the rapidity of growth not only in children of the same sex, but also in those of a different sex, and not only in single births, but even in the case of twins. One may flourish and grow while the other remains puny. The average that is ordinarily expected is that a child should measure about two feet high by the end of the first year, and should weigh about 20 lbs., with proportionate increase from birth upwards.

The following table, taken from Tidy's "Leg. Med.," p. 163, gives the average monthly weights of young children during the first year:—

	lbs.	oz.		lbs.	oz.
At birth	6	8	7 months	13	4
1 month	7	4	8 ,,	14	4
2 months	8	4	9 ,,	15	8
3 ,,	9	6	10 ,,	16	8
4 ,,	10	8	11 ,,	17	8
5 ,,	11	8	12 ,,	18	8
6 ,,	12	4			

Age from One Year to Puberty.

When once the teeth have started to appear there can be no question but that they form the most reliable means for the estimation of the age of a child (*vide ante*) from, say, a year old up to puberty, whether such child be living or dead; in the dead it is possible to corroborate such evidence by the bones, for which purpose a table is here inserted of the principal points in the ossification of bones, taken largely from Gray's "Anatomy," and tabulated. The figures must not be taken too rigidly, but only as implying an average.

	Ossification of	
	Foot.	*Hand.*
6th month, intra-uterine.	Os calcis (body).	Whole hand cartilaginous during intra-uterine life.
7th ,, ,,	Astragalus.	
9th ,, ,,	Cuboid.	
1st year, extra-uterine.	External cuneiform.	Os magnum and unciform.
3rd ,, ,,	Internal cuneiform.	Cuneiform.
4th ,, ,,	Mid cuneiform.	
5th ,, ,,	Scaphoid.	Trapezium and semilunar.
6th ,, ,,		Scaphoid.
8th ,, ,,		Trapezoid.
10th ,, ,,	Os calcis, epiphysis of.	
12th ,, ,,		Pisiform.

Appearance of other Points of Ossification.

1st year	Heads of humerus, femur, and tibia.
2nd ,,	Lower ends of radius, tibia, and fibula.
3rd ,,	Patella, great tuberosity of humerus.
4th ,,	Upper end of fibula, great trochanter.
5th ,,	Lesser tuberosity and internal condyle of humerus.
10th ,,	Upper end of ulna.
13th to 14th year	External condyle of humerus and lesser trochanter.

Union of Bones and Epiphyses.

By 1½ years	the anterior fontanelles should be closed.
,, 9 ,,	the ilium, pubes, and ischium should meet in the acetabulum.
,, 13 ,,	these three should be united but still separable on maceration.
,, 15 ,,	the coracoid should be united to the scapula.
,, 16 ,,	the olecranon ,, ,, ,, ulna.
,, 18 to 20 ,,	the head of the femur should have joined the diaphysis.
,, ,, ,,	the epiphyses of the long bones of hand and foot should have united to diaphyses.
,, 20 ,,	the epiphyses of fibula should be united to the diaphysis.
,, 25 ,,	the epiphysis of the sternal end of clavicle should be united.

If all the epiphyses are found united, the individual is almost certainly over twenty-five years of age, and if the three parts of the sternum are united by bone he is almost certainly thirty-five or over.

We stated above that these points could be only investigated in the dead, but with the aid of Röntgen rays ossification in epiphyses and their union with the diaphyses can be ascertained with almost the same accuracy in the living as the dead, for bone is peculiarly resistant to these rays (*vide* also on "Insurance," on discovering fractures by this means).

Height and weight are too variable to be of much use, but the following table shows the averages with which a given individual may be compared. It is taken from Tidy's "Leg. Med.," p. 167.

The subjoined figures are reduced from the French weights and measures given in Quintelet's "Anthropométrie" (Brussels, 1870). They are the averages of a large number of observations on Belgians, and are probably a little under the mark as regards the English.

Males.			Females.		
Age in Years.	Height in Inches.	Weight in Pounds.	Age in Years.	Height in Inches.	Weight in Pounds.
Birth.	19·7	6·8	Birth.	19·3	6·6
1	27·5	19·8	1	27·0	18·9
2	31·0	24·2	2	30·7	24·2
3	34·2	27·5	3	33·6	27·2
4	36·6	30·8	4	35·9	30·5
5	38·8	34·9	5	38·5	33·6
6	41·2	39·1	6	40·7	36·7
7	43·4	43·3	7	42·9	39·1
8	45·7	47·5	8	45·5	41·8
9	48·1	51·7	9	47·4	46·2
10	50·4	55·4	10	49·2	50·8
11	52·5	59·4	11	50·6	56·1
12	54·5	63·8	12	52·7	63·8
13	56·4	72·8	13	55·8	71·5
14	58·6	81·6	14	58·1	79·8
15	61·0	90·6	15	58·9	88·0
16	63·0	99·8	16	59·8	95·7
17	64·6	109·3	17	61·1	102·9
18	65·2	118·5	18	61·6	109·5
19	65·6	126·7	19	61·8	114·6
20	65·8	130·9	20	62·0	117·0
21	*65·5	134·6	21	62·1	119·4
22	*66·2	138·3	22	—	120·0
23	*66·2	141·9	23	—	121·4
24	*65·9	—	24	—	—
25	*66·3	145·6	25	—	120·5
27	*66·4	144·9	27	—	121·2
30	66·3	145·4	30	—	121

* The heights with asterisks are from Danson.

The gradual growth of hair on the pubes, commencing with a soft, downy growth at about ten to thirteen, is a little more reliable, showing at least an approach to puberty. The development of the breasts in girls is very vague, and liable to be altered by loose habits. The voice undergoes in boys a marked change as puberty comes on, losing its shrill infantile treble and taking on a deeper note, tenor or bass—the breaking of the voice in common speech. It must be stated that tastes, habits, and inclinations, usually vary somewhat with age in children, comparing the sexes each with specimens of the same sex, but some boys of fifteen are almost men in these respects, and others still children; and the same may be said of girls, some of whom are married at seventeen, while others at the same age are fitted only for the nursery.

To discuss these variations and their causes further would take us too distinctly into the region of the medical officer of health.

Age in Persons over Puberty.

We have now lost pretty nearly every scientific proof of age, whether in the living or the dead. It is true that common knowledge comes

more or less to our aid, enabling us to make a fair approximation to the decade within which a person may be, but any closer approximation must be made with so many reservations as to be hardly worth consideration. The tell-tale crow's feet about the eyes may easily be produced by prolonged suffering, anxiety, or worry; white hair often comes on in quite young people from grief or shock, and often for no reason at all that can be estimated: tortuous arteries and arcus senilis (in the eye) are rarely seen before forty it is true, but when that age is passed they lose even this small value. Hence, in the absence of documentary proof or of some very exceptional circumstantial evidence, it is impossible to swear to the exact age of an adult.

We have already inserted a table of ossification which helps us materially up to the age of twenty-five to thirty, beyond that we may notice the ossification of the cartilages of the ribs, a thinning of the bones of the skull, and a sinking of the head of the femur, all of which occur in some degree after, say, forty-five to fifty, or even a little earlier; it is possible, too, for an edentulous jaw to suggest that its possessor was an old man.

It must be an extraordinarily unusual concatenation of circumstances that could demand any rigid evidence of this nature from a medical jurist.

Medico-Legal Questions Concerning Age.

Having considered, then, the means that are available for determining age, we must now consider the medico-legal aspects of the age so determined. One or two preliminary remarks must first be made that are of the most general application to all ages, and have a very special bearing on the duty of accoucheurs.

A child is not supposed by the law to be born till it is *completely external to the mother*, but no mention whatever is made of the severance of the cord, nor of the expulsion of the placenta, neither of which acts have, in the eyes of the law, any reference to the birth of the child, which is concluded directly the whole of the child has left the vulva (for the effects of this statement on infanticide, *vide* "Infanticide"). Here we have to caution accoucheurs to note the time with special exactness when a child is engaged in being born about midnight, so that should the head or other part be born before midnight and the remainder after that hour, he may register the birth as having occurred on the day after the commencement of the parturition (*vide* below for a case in point).

In the eyes of the law a child arrives at a given year of age at the first instant of the day preceding his birthday, in the common meaning of that word, and in thus reckoning days no account whatever is taken by the law of parts of a day; thus, a child born at 11.59 on the night of the 3rd of May, 1904, is in the eyes of the law fourteen, say, the first moment after midnight of the 1st of May, 1918. It is quite obvious that in deciding such cases, nothing short of absolutely decisive documentary proof or sworn evidence of reliable witnesses to the act of parturition will be accepted.

Evidence as to age may be demanded under the following circumstances :—

(*a*) As an aid to identification.

(*b*) In questions of criminal responsibility.

(*c*) In questions of rape.

(*d*) Capability as a witness.

(*e*) In the making of wills.

(*f*) In entering the marriage tie.

(*g*) As regards capability of procreation, involving impotence, legitimacy, etc.

(*h*) Age in civil employment.

(*a*) **Age in Identification.**—If an adult man be missing, it is obviously useless to produce the body of a young boy as that of the missing man, so that age is of some obvious importance in identity; but there are so many other points in identity which have been fully discussed that precise evidence as to age is not of much intrinsic value by itself except under very rare circumstances, such, for instance, as cases where a baby some few days old is alleged to be the newborn child of a lying-in woman; but even here more is likely to depend on collateral suspicious circumstances than on the age of the child, the latter probably only rousing suspicion that something was wrong.

(*b*) **In Questions of *Criminal* Responsibility.**—Kenny, "Outlines of Criminal Law," 1902, p. 49, says : "By the law of crime infants are divided into three classes :—

"(i.) *Those under seven years of age.*—There is conclusive presumption that children so young cannot have *mens rea* at all; nothing, therefore, that they do can make them liable to be punished by a criminal court; though it is not illegal for parents to administer a domestic chastisement to such children." In the words of Erle, J.: "the law presumes that a child under seven years of age is incapable of committing a crime."

"(ii.) (Kenny, *loc. cit.*). *Those between seven and fourteen.*—Even at this age 'infants' are still presumed to be incapable of *mens rea;* but the presumption is no longer conclusive, it may be rebutted by evidence. Yet the mere commission of a criminal act is not necessarily, as it would be in the case of an adult, sufficient *primâ facie* proof of a guilty mind. The presumption of innocence is so strong in the case of a child under fourteen that some clearer proof of the mental condition is necessary. The necessity for special proof of *mens rea* in the case of an infant of this age is impressed upon the jury who try him, by their being asked not only the ordinary question, 'Did he do it?' but also the additional one, 'Had he a guilty knowledge that he was doing wrong?'

"This guilty knowledge may be shown by the fact of the offender's having been previously convicted of some earlier crime; or even by the circumstances of the present offence itself, for they may be so marked as to afford distinct proof of a wicked mind. Thus a boy of ten who had killed a companion and buried the body in a dunghcap was convicted of murder. And a boy of eight was hanged in 1629 for burning two barns; 'it appearing that he had malice, revenge, craft and cunning.' Two boys, aged eight and nine respectively, were tried at Liverpool, in 1891, for murder; they had drowned another boy, in

order to steal his clothes; but they were acquitted on the ground of their infancy."

Between the ages of seven and fourteen, no presumption of law arises at all; and that which is termed a malicious intent—a guilty knowledge that the child was doing wrong—must be proved by the evidence, and cannot be presumed by the mere commission of the act. In one case a boy was *ten* years of age, and was indicted for setting fire to a hayrick. There was no evidence of any malicious intention, and the jury acquitted the prisoner, considering that at the time he fired the rick, he had no guilty knowledge that he was committing a crime. If, however, any facts should show that there was a guilty knowledge, a child even under ten years may be found guilty, on the principle of *malitia supplet ætatem:* but the younger the child, the stronger the evidence which would be required for conviction. In these cases age is proved, not by a medical examination, but by the production of legal documents, or the oral testimony of relatives. In respect to criminal responsibility as affected by age, it was held by Keating, J., in one case (*Reg.* v. *Cowley*, 1860), in which the prisoner, a boy aged *eight* years, was charged with felony, that up to seven years of age the law presumed that a child could not distinguish right from wrong, so as to be capable of crime; and evidence was not admissible to prove that he possessed that capacity. But after the age of seven, and up to fourteen years, though the law presumed a child to be *primâ facie* incapable of crime, this presumption might be rebutted by evidence which showed that he had what was called a mischievous discretion. In this case there was no evidence of that sort, and therefore his lordship directed the jury to acquit the prisoner. In another case, tried before the same judge in May, 1863 (*Whitby* v. *Hodgson*), an action for trespass and false imprisonment was brought against a man for giving into custody, on a charge of stealing, a boy under six years of age. It appeared that the child had stolen some wood; but it was held that at this age, and under seven years, a child was *doli incapax*—hence that the defendant was not justified in giving the boy into custody. The jury returned a verdict with damages against the defendant. A case involving a similar question came before the same judge, in reference to a charge of manslaughter (*Reg.* v. *Burrows*, Bedford Sum. Ass., 1872). William Burrows was charged with the manslaughter of Frederick Hopkins. The prisoner was about *eight years* old. He, and the deceased, a little boy of about the same age, were running about together, and each had a stone in his hand. They threw at each other, and the prisoner's stone struck the deceased. Erysipelas set in, and the boy Hopkins died. The medical evidence showed that death was caused by erysipelas brought on by the blow; that the deceased was a weakly child, predisposed to the complaint of which he died; and that the blow would not have been sufficient to cause death in a healthy subject. Keating, J., told the jury that, the prisoner's age not appearing upon the calendar, the case had been allowed by him to go before the grand jury without the direction to throw out the bill, which would otherwise have accompanied it. A true bill having been found, it was now their duty to deal with it. For their guidance in so doing, his lordship told them that the law declared children under the age of seven years to be

incapable of the intent necessary to support a charge of felony. Between the ages of seven years and fourteen years, the law presumed the absence of the intent, but allowed the facts to be laid before a jury that they might judge whether there were circumstances showing that, in spite of tender years, such an intent in fact existed. Applying this principle to the present charge of causing death by an unlawful act, the question would be, did they consider the prisoner capable of knowing that what he did was an unlawful act? The prisoner was acquitted.

A child under fourteen, indicted for murder or arson, must be proved to be conscious of the nature and criminality of the act. In the case of *Reg.* v. *Vamplew* (Lincoln Sum. Ass., 1862), a girl under fourteen years of age was convicted of destroying the life of a child by strychnine. It was shown that she was competent to understand the nature of the act.

"(iii.) (Kenny, *loc. cit.*). *Between fourteen and twenty-one.*—At fourteen an infant comes under full criminal responsibility. A trifling exception, of no practical importance, is said by old writers to exist in the case of some offences of omission, which are criminal merely technically and involve no moral guilt (*e.g.*, non-repair of a highway). In such cases the effect of infancy in producing an exemption from criminal responsibility for the omission is, however, ascribed by Blackstone not so much to any immaturity in the infant's mind, as to his not having the command of his fortune till he is twenty-one, and therefore probably not having the pecuniary means necessary for discharging the duty which he has omitted."

(*c*) **Age in Rape and Sexual Offences.** — The law has decided to make certain definitions relating to age here which are very important:—

"(i.) A boy under fourteen is presumed to be incapable of rape as a principal in the first degree, *i.e.*, as the actual perpetrator of the offence, and even of committing an assault with intent to rape; whether this (in certain cases) is wise or not is a matter with which medical men have nothing to do, they have simply to decide whether the boy is fourteen or not; if the registration-of-birth certificate can be produced this is conclusive; if it is not available a doctor must use the facts above stated; the teeth and pubic hair are the most reliable; the size and development of his sexual organs may have produced severe injury upon the girl, and may suggest his being over fourteen, but the defence will want proof, not mere probabilities.

"(ii.) To have connection with a girl under thirteen is a felony, and consent is no excuse; between the ages of thirteen and sixteen the offence is reduced from a felony to a misdemeanour if consent can be proved; and at sixteen and over, consent is accepted as a good excuse; moreover, when consent is admitted or proved it is accepted as a good defence provided that the jury or judge is satisfied that the girl looks sixteen and might be judged by the prisoner to be of sixteen years of age, and this, no matter what her actual age may be."

In other words, a girl under thirteen is presumed to be incapable of giving consent at all; between thirteen and sixteen she is presumed to know something of what consent means, but even this must be strictly proved before the law will allow it to mitigate the offence.

Although under recent legislation the following case could not arise, as the girl was only twelve, it is worth retaining for the important principle involved about the exact hour of birth (*Reg.* v. *Thornhill*, Stafford Lent Ass., 1865) :—The prisoner was indicted for a misdemeanour, in carnally knowing and abusing a girl above the age of ten and under the age of twelve years. It appeared in evidence that the girl's birthday was on December 5th, 1852, and the offence was alleged to have been committed on December 4th, 1864. The question then arose whether the girl was under the age of twelve years, so as to bring the offence within the (then) statute. It was objected by the prisoner's counsel, that as on December 5th the girl would enter on her thirteenth year, she had therefore completed her twelfth year on December 4th, and that the law did not recognise a fraction of a day in such a case, so that she was twelve years old as much on the first hour of that day as on the last, and Pigott, B., so held. The indictment contained counts alleging rape and assault, but, after the cross-examination of the girl, his lordship stopped the case, and the prisoner was acquitted.

(*d*) **Capability as a Witness.**—This is left almost entirely to the discretion of the judge; if he is satisfied that the child is old enough to appreciate the seriousness of the situation he may determine to accept the evidence. It is very easy to imagine circumstances in which children are the only available witnesses, and the judge may have to choose between accepting such evidence and allowing a criminal to escape. As medical jurists, we can say nothing further on the point. For a case where medical corroboration of a child's evidence was very important *vide* under "Wounds."

(*e*) **In the Making of Wills, Borrowing Money, Pledging Credit, etc.**—The law does not allow the full power of disposing of property by will or even gift until the person in question has reached the full age of twenty-one years; but it does all the same permit persons to fix the age at which a legatee may assume full control of a legacy, but no debt can be recovered by law from a person under twenty-one. The matter is again, however, of but little interest for the medical jurist, for in all such (and many other) cases documentary evidence of age will be required, and not mere medical evidence.

(*f*) **In entering the Marriage Tie.**—The statutory age in England is, for boys, fourteen, and for girls, twelve; inasmuch as a boy under fourteen is considered incapable of rape and a girl of twelve incapable of giving consent, it is quite obvious that the law on this matter requires revision to avoid such an absurdity as that of permitting a criminal act to be performed upon a girl who cannot give consent.

(*g*) **In Procreation, etc.**—Before puberty, which is very variable in its onset, a boy is naturally sterile, though he need be by no means impotent (*vide* "Impotence and Sterility"). A girl before puberty is of necessity neither sterile nor impotent, for cases are recorded of girls bearing children before menstruation (which is taken as the proof of puberty), and the vulva and vagina are certainly capable long before puberty of receiving the male organs. At the other end of life there is no known limit, while life exists, either to potency or fertility on the part of a man; and though women become sterile after the menopause they are never on the score of mere age impotent. The matter will again be referred to in discussing impotence and sterility.

(*h*) **Age in Civil Employment.**—In January 1904, an Act known as the Employment of Children Act came into force. With its exact provisions the medical jurist has little to do, but there seems no reason to doubt that it will give rise to many cases of the nature of disputes about the exact age of children. It is probable that the X rays will here be called into service. Fourteen years is chosen as the critical year separating childhood from adolescence.

23. **Identity of Mutilated Remains.**—A dead body partially putrefied, may be found mutilated, and parts of it may be discovered in localities distant from each other. There is less difficulty here in making out identity, than where only bones are discovered; for it is by no means easy to say whether certain bones belonged to the same skeleton or not. So long as the soft parts are attached to them, there will be no difficulty in forming an opinion. Those who commit murder, and thus dispose of a body, believe that identity must be entirely destroyed, if they only deposit the parts in remote places. In this respect they are, however, generally deceived, for satisfactory evidence may still be forthcoming.

Naturally, the first point in identification must be to determine that the fragments are *human* remains. If it is merely a piece of muscle or viscus such may be difficult or impossible; if, however, some skin is attached or bones are present, there will be no difficulty in saying that such bits are or are not human, and with considerable parts of or whole limbs judgment is still easier and a matter of course. It would be impossible for any medical man now to have any doubt between a human hand and the fin of a turtle, though such a case once actually occurred in 1838.

Having determined, then, that the fragments are human, they must be carefully inspected for

1. Any marks of identification in our foregoing list, scars, tattoos, fractures, hair, etc.

2. Note which side of the body they come from, whether, for instance, two right hands are present, etc.

3. Note particularly what means have been employed to separate the fragments, saw, knife, etc.

4. Note how they have been separated, hacked or carefully disarticulated.

5. Note if anatomical dissection has been carried out on them. On this Dr. Taylor remarks:—"When parts of dead bodies are found, a section of the public adopt the hypothesis that some medical student has resorted to this method of disposing of parts of a dissected subject. Thus, in the *Case of Greenacre*, there was a disposition to refer the first portion of the mutilated remains which were discovered to a wanton act of this kind. The erroneousness of this view was proved only by the subsequent discovery of the corresponding parts of the dead body and the detection of the murderer. So in reference to the case of Parkman, the mutilated remains were at first described as anatomical preparations. Such an hypothesis is, of course, favourable to the escape of criminals, and is prejudicial to the course of justice. It points out to the assassin an easy method of deceiving the public; and it shows that if he only mutilates a corpse by removing and destroying the head, hands, and feet, leaving the remainder of the body

to be discovered accidentally, he has a far better chance of escaping detection and punishment than by attempting to conceal the entire murdered body. The Waterloo Bridge case formed no exception to the protection thus unintentionally extended by public opinion to a foul act of murder. Any one acquainted with anatomy and the dissection of bodies would at once perceive from the description that no portion of this body could have been used for such a purpose. Medical students do not, as part of their anatomical pursuits, hack and mangle a dead body so as to destroy muscles, vessels, nerves, and spinal marrow; they have no occasion to make away with those parts by which a body may be identified, or to boil and salt the remainder; they do not receive corpses for dissection with their clothes, nor is there any conceivable reason why, if they did, they should produce cuts and stabs and stains of blood on the inside of the clothes with such accuracy as to correspond to the effects of wounds inflicted on a living man."

6. Fit the parts together as accurately as possible if more than one have been found. When isolated bits are found at different times they should be carefully preserved in formalin: this, it is true, shrinks them somewhat, but it hardly prevents such fitting together as above suggested.

7. Note what treatment the parts have been subjected to—boiled, burnt, treated with lime or carbolic acid, etc., etc.

8. If vital organs are available or large vessels, note whether injuries have been inflicted which might have caused death, and whether any injuries found were inflicted before or after death (*vide* "Wounds.")

9. If the head is available the teeth may afford most valuable assistance in identity (*vide* "Teeth," p. 139).

The following cases are very instructive on all these points:—

In the case of the woman Brown, murdered by Greenacre in 1837, the head, trunk, and limbs were scattered in widely distant parts of London. The limbs were not found until six weeks after the trunk, and then at a considerable distance and under very different circumstances. In the examination of the trunk, it was observed that the fifth cervical vertebra had been sawn through, leaving only about the tenth of an inch of that bone. When the head was found it was observed that the fifth cervical vertebra had also been sawn through, leaving only the posterior spinous process. On comparing the head with the trunk they fitted exactly, even to the continuation of a superficial cut on the skin. On afterwards comparing the trunk with the legs, it was ascertained that the cut surfaces exactly corresponded. The thigh-bones remaining attached to the trunk, had been sawn through about an inch below the trochanters, to about one-half of their thickness, and then broken off. When the limbs were discovered six weeks afterwards, the portions of thigh-bones found exactly corresponded in the marks produced by the saw and in the portions broken. Not only were the parts of the body thus proved to belong to one and the same woman, but the individual was further identified by the peculiarity of the absence of a uterus.

In a case of infanticide the arm of a child was found concealed in a dust-hole of the house, while at about the same period a body without an arm, and the head of a child, were found in a ditch at some distance from the house where the accused person was living. The identity was, however, distinctly made out by the fact that the arm and scapula attached to it fitted exactly to the trunk, and that the incisions through the muscles and vessels completely corresponded.

On the occasion of a murder perpetrated at Brighton the head and subsequently the body of a female was found in different and distant places. They were identified as belonging to the same individual: first, from the fact that there were four cervical vertebræ attached to the trunk and three to the head; and secondly, from the divided vessels and cartilaginous rings of the trachea exactly corresponding. The importance attached to this kind of anatomical evidence shows that

when a portion of a dead body is found, the whole of the parts which form the boundary of the section, should be attentively observed and accurately described.

The case of *Dr. Parkman*, for the murder of whom *Professor Webster* was tried and convicted at Boston, U.S., in March, 1850, presents a remarkable instance of the value of scientific evidence, in establishing the identity of a mutilated body. It also proves that even all the refinements of science *will* fail in the attempt so to dispose of a dead body in a case of murder, as to prevent its identification. On November 23rd, 1849, the deceased was traced to the laboratory of the prisoner, and from that date he was missing. A week after his disappearance there were found concealed in the vault of a privy belonging to the prisoner's laboratory, a pelvis (the hip-bones), the right thigh (from the hip to the knee), the left leg (from the knee to the ankle); —and with them certain towels bearing the initials of the prisoner, and being such as were used by him. Among some cinders and slag connected with a furnace, were found portions of bones, apparently of the cranium, fragments of vertebræ, blocks of artificial teeth, and some gold which had been melted. On the day following, in a remote corner of the laboratory, there was found a tea-chest containing, imbedded in a quantity of tan and covered with minerals, the entire trunk of a human body, with the left thigh from the hip to the knee. When the parts were placed in apposition with the portions previously found, they corresponded, so that they were obviously parts of the same body. This observation also applied to the remains of bones (cranium and vertebræ) found in the slag of the furnace. There was no duplicate portion. All the fragments fitted so as to form part of the same human skeleton. The portions thus found resembled in every particular the body of Parkman, and in no single particular were they dissimilar from the body of the deceased. There were missing from these remains, when they were placed in apposition, the head, the arms with the hands, both feet and the right leg from the knee to the ankle.

Fig. 18.



Dr. Parkman's remains restored. The missing parts are black.

The parts found (which are light in the engraving fig. 18) were examined by several medical men. They deposed that they were human remains, parts of one and the same male human body; that they had not undergone dissection for anatomical purposes, and had not been submitted to any process of preservation. Further, that they had been cut and hacked in different directions without any reference to their anatomical relations, and evidently by a person only partially acquainted with the structure of the body. The chest was still covered with the muscles and skin. It was noticed that under the left nipple, between the sixth and seventh ribs, there was an opening which penetrated into the cavity. The opening was slightly ragged, and about 1½ inches in length.

It seems that Parkman was sixty years of age, and his stature was 5 feet 11 inches. The portions of the body thus restored were those of a person between fifty and sixty years of age; and with respect to stature, the portions found, extending from the seventh cervical vertebra to the outer ankle (malleolus), measured 57½ inches. The distance from the sole of the foot to the outer malleolus, measured in another subject of the same age, was 3 inches; and the distance from the top of the head to the base of the sixth cervical vertebra was 10 inches. Adding these measurements to the missing portions, the total length of the body found would be 5 feet 10½ inches, being within half an inch of the stature of Parkman. There were marks of identity about the teeth and jaws which left no doubt that the remains were those of the missing man. An attempt had been made to destroy the skin and flesh of the chest by the use of a strong solution of potash, but this had failed. The defence of the prisoner rested upon the fact that the charge was based entirely on circumstantial evidence, that the identity of the remains had not been satisfactorily made out, and that no cause of death had been proved. The jury, however, returned a verdict of guilty, and the prisoner was subsequently executed (see "Rep. of the Trial of Prof. Webster," by Dr. Stone, Boston, U.S., 1850).

A singular case involving somowhat similar questions occurred in London in October, 1857, when the remains of a human being were found in a bag on one of tho buttresses of Waterloo Bridge. It appeared that they had been accidentally deposited there the night previously—the intention of the person who carried them being, no doubt, to lower them into tho river, but by accident they lodged on one of the buttresses of the bridge. A number of articles of clothing were in the bag with the remains. These romains were submitted to the examination of the divisional surgeon of police and tho author.

They found them to consist of parts of a human body, and obviously of the same body; as, when allowance was made for the missing portions, they admitted of an accurate adjustment to each other. There were twenty-three portions of the body discovered, consisting chiefly of bones with flesh adhering to them. The flesh had been roughly cut from the bones, apparently with a view to remove as much

Fig. 19.

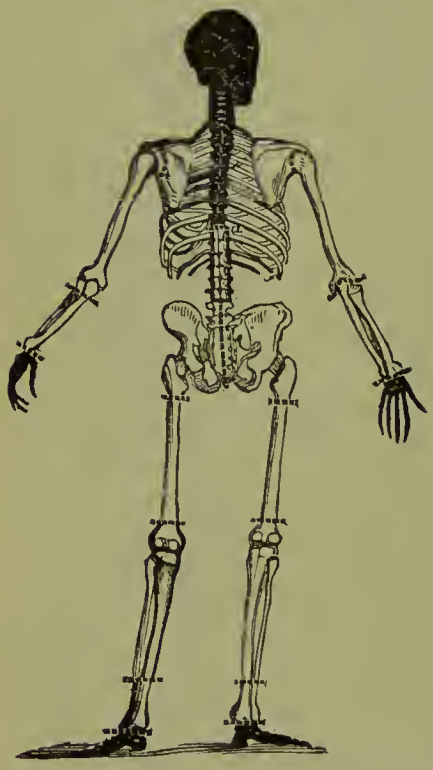
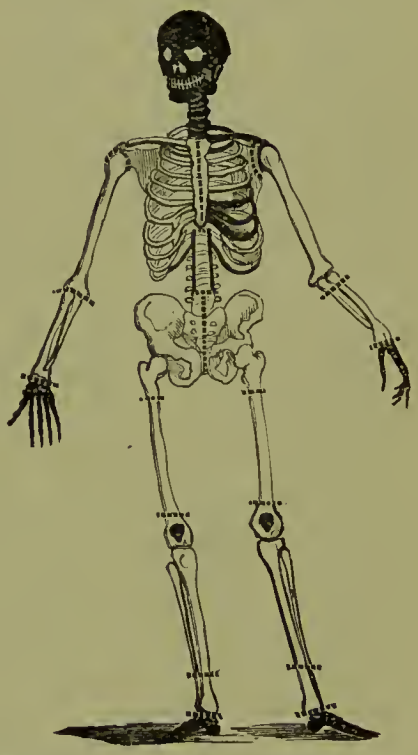


Fig. 20.



Waterloo Bridge remains restored. Front and back view of the Skeleton. Dotted lines showing where the bones were cut or sawn. Missing parts black.

of it as possible, and to destroy the identity of the body. The parts had been cut and sawn into small parts, probably to reduce their bulk and to allow them to be packed within a small space. The trunk, including part of the chest and spine, had been cut into eight pieces; the upper limbs had been cut or sawn into six, and the lower limbs into nine pieces. The hip and elbow-joints were in a strongly flexed condition. The missing portions (which are marked black in the engravings figs. 19 and 20) were the head, with the greater part of the spine, namely, fourteen out of twenty-four vertebræ (seven cervical and seven upper dorsal), the hands, the feet, and some portions of the left side of the chest. It will be observed that these were also the parts which were missing in the case of Parkman. In fact, a murderer intending to destroy personal identity, would in general most effectually succeed in his object by removing the head, feet and hands. The whole of the viscera of the chest and abdomen had also been removed. The twenty-three fragments found weighed only 18 lbs. This is about one-eighth part of the average weight of the adult body. The questions which required solution in this case were the following:—1. The sex, age, and stature of the deceased; 2. The presence of any physiological or pathological peculiarities in reference to personal identity; 3. The presence of any wounds or marks of violence, with reference to the probable

cause of death; 4. The general condition of the remains, with a view to determine whether they were parts of a dissected body, and whether they had undergone any chemical process for the purpose of preservation; 5. The length of the period which had probably elapsed since the death of the deceased. The details of this examination will be found elsewhere (*Med. Gaz.*, October 31st, 1857, p. 445). There was no difficulty in determining the sex of the deceased, as a portion of the sexual organs, which had been mutilated (not dissected), still remained attached to the pelvis. The long bones were in their full state of development. The stature was determined by taking the length of the portions found, and adding a certain number of inches for the missing skull, cervical vertebræ, and feet. The bones had been sawn through near the joints with a fine bone-saw, such as is used by bone-boilers. On the left side of the chest, between the third and fourth ribs, there was a stab which had penetrated the cavity, and which, if inflicted upon a living person, would have been in a direction to enter the heart. The edges of this wound were everted and wide apart, and the muscles around were infiltrated with blood. It had those characteristics which are observed in wounds inflicted on a living body. In Parkman's case there was a similar wound penetrating the chest on the left side between the sixth and seventh ribs. No portion of these remains had the appearance of having undergone dissection or any preparation or use for anatomical purposes. There was no injection of blood-vessels; the muscles, vessels, and nerves had been cut through, or rather hacked in all directions, without any reference to relative position. The spinal marrow had been violently torn out of the vertebral canal, and was left hanging by its sheath to the vertebræ. The joints had been sawn through, evidently with great trouble, at points where a scalpel, even in the hands of a young anatomist, would have speedily effected the separation of the limbs. Further, no preservative of animal matter had been employed. There was no trace of arsenic, corrosive sublimate, nitre, alum or chloride of zinc, in the soft parts. Portions of the muscular fibre were brown and sodden; they presented the appearance of having been boiled in water and soaked in a solution of common salt, which was separated from them by crystallisation. Portions of the skin, as well as the ligaments of the joints, had a similar appearance, *i.e.*, of having been submitted to the action of boiling water. From the condition of the soft parts and joints, it appeared probable that the body had been cut up and exposed to a boiling temperature, while the members were in a state of cadaveric rigidity. The examiners considered that the boiling and the salting of the remains had been resorted to in order to prevent any offensive smell as a result of putrefaction, which might have led to their discovery. The interior of the right hip-joint, and the deep-seated portions of flesh around the joint, had escaped the action of salt and water; and from the condition of these parts, as well as other circumstances, they formed a conclusion respecting the probable period at which this person had died. The conclusions from the whole of the investigation were as follows:—

1. That the remains were those of a person of the male sex, of adult age, and of at least 5 feet 9 inches in stature; 2. That the parts found presented no physiological or pathological peculiarities by which they could be identified as belonging to any particular individual. The only fact observable under this head was, that the portions of skin remaining were thickly covered with dark hairs, and that the deceased was probably a dark, hairy man; 3. That the remains presented no appearance of disease or of violent injury inflicted during life, with the exception of a stab in the space between the third and fourth ribs on the left side of the chest. This stab was in a situation to penetrate the heart and cause death. It had the characters of a stab inflicted on a person, either living or only recently dead; 4. That these remains had not been dissected or used for the purposes of anatomy. All those parts of the human body which are useful to an anatomist had been roughly severed and destroyed by a person or persons quite ignorant of their anatomical relations. They had been probably cut and sawn before the rigidity of death had ceased, *i.e.*, within from eighteen or twenty-four hours after death; and in this state had been partially boiled and subsequently salted (placed in brine). The body of deceased had not been laid out or attended to like that of a person dying from natural causes, whose body might be lawfully used for anatomical purposes; 5. That the person of whose body these remains were a part, may have been dead for three or four weeks prior to the date at which they were examined, namely, on October 21st, 1857.

The articles of dress found with the remains in the bag were those of a man

and a foreigner. They were much torn, and some presented the appearance of stabs and cuts, while all were more or less stained with blood, some of the stains presenting coagula. A stab through the double-collar of an overcoat must have been inflicted with great force, as it was found to extend through corresponding parts of the undercoat and waistcoat. All these articles of dress had stains of blood on the inside, and chiefly on the left side of the body, in the parts corresponding to the stab on the left side of the chest. The cutting and tearing of the dress may have arisen from the removal of the clothes while the body was in a state of rigidity in a constrained attitude. The state of the clothes was consistent with their having been worn by the deceased when he was subjected to violence which led to his death.

From inquiries made by the police, there was reason to believe that the remains were those of a Swedish sailor from a vessel then in the river. It is believed that he met with his death by stabbing, and that after a short concealment, his body, cut up and mangled in the manner described, was disposed of by throwing it into the river. The head and other missing parts had probably been thus got rid of; and it was only by the accident of the bag lodging on a buttress of the bridge, instead of falling into the river, that these remains were found. As the deceased was most probably a foreigner whose name was not known, and of whose personal appearance no description could be given, there was no clue to the perpetrators of this murder. In this respect it resembles some murders of recent date, in which the bodies have been discovered either entire or mutilated.

This case called forth from Dr. Taylor the caustic remarks above about medical students and their dissections.

In 1875, the remains of a woman, Harriet Lane, were conveyed into the Borough, she having been murdered by her paramour, Henry Wainwright, in Whitechapel. On September 7th, 1874, the deceased woman went in a cab to premises in Whitechapel Road, and was never again seen alive. In September, 1875, a year later, the premises were likely to pass from Wainwright into the hands of others; and he resolved to remove the body of the woman, whom he had murdered and buried, to another hiding-place in Southwark. A few days before, the prisoner employed his brother to purchase for him a spade and a small chopper or axe. These articles were found on the premises after the removal of the body. The chopper had on it putrescent animal matter, and the spade clay mixed with lime. On the same day, Wainwright purchased three yards of American cloth and a quantity of cord. On September 11th, 1875, a man, employed by Wainwright, was arrested in the Borough, having in his possession two packages, wrapped in similar American cloth and secured with similar cord, containing human remains. On opening these, Larkin found one parcel to contain the trunk, and the other bundle the remaining portions, which collectively were the remains of a human female, about 5 feet high, and about twenty-five years old, and those of a thin person. The body, which was supposed to have been dead about a year, had been very recently and most unscientifically dissected. It was in a stinking and decomposed state; some parts were more or less mummified, whilst other parts were in a condition tending to adipocere. The body was, roughly speaking, divided into ten parts, as follows:—Two arms; two hands; the legs and feet connected, the left leg including part of the patella; the thighs including portions of the pelvis (the right thigh included the patella, the left thigh included part of the patella); the trunk, except the front of the pelvis; the head and neck. Though the woman had been dead a year and buried in a grave on the premises, certain parts had been well preserved, owing to the use of chlorinated lime, employed with the mistaken view of destroying the body, whereas it had acted as a preservative.

The cause of death was obvious. There were two bullets in her brain, and a third was found in a hair-pad at the back of the head. There was a cut extending from the centre of the throat to the angle of the lower jaw, which had severed all the tissues, and which must have been inflicted with considerable force. There could not be a doubt that the woman had been deprived of life by pistol-shots. There was reason also to think that the first shot was just behind the right ear, and the bullet was found to have caused an extravasation of blood 3 inches in circumference. Another bullet was found in the brain; there was a cut in the throat, the other bullet having probably been fired when life was ebbing; and another had flattened against a mass of hairpins, which had no doubt prevented

it going into the head. Probably the murderer came up from behind, and fired the first shot from the back of the head; and that, finding the first shot ineffectual, he had brought the pistol round and fired it just behind the right ear; and then, not certain that it would answer the purpose of destroying life, the third shot was fired. The cut in the throat was of old date, and must have been inflicted either immediately before or immediately after death. As the principal arteries of the neck were divided, it would have been sufficient of itself to cause death. Probably this wound was inflicted after the pistol-shots had been fired.

In this case the identification of the remains was based partly on medical facts, and partly on the discovery of certain articles of dress in the grave from which the body had been removed. The features were not recognisable. The body had been cut into ten pieces and much mangled. It was decomposed; but, as a quantity of chlorinated lime had been used in the burial of it, putrefaction had been in some degree retarded. The relatives could only speak generally to the slender form and stature of the body, and the smallness of the hands and feet, as points in which it resembled that of Harriet Lane. The light auburn colour of the hair, the absence of a tooth in the upper jaw on the right side, and the presence of a scar or cicatrix from a burn received many years before, and still remaining on the right leg below the knee, were also circumstances which strengthened their opinion. Some buttons and other articles of dress found in the grave, such as those which were actually worn by the deceased on the evening of her death, were identified by her relatives. The direct proofs were: 1. The *age*.—The age of the deceased was twenty-four. Judging by the wisdom teeth, three of which had appeared, this corresponded with the age assigned to the body. 2. *Stature*.—It was inferred, but by no means directly proved, that the deceased was 5 feet $0\frac{1}{4}$ inch in height. The remains, when put together, represented a stature of 4 feet $11\frac{1}{8}$ inches. This makes about an inch difference, which was accounted for by one of the medical witnesses, as a result of the shrinking of the intervertebral substance, hence the defective length of an inch was consistent with the remains being those of a person of the height of the deceased. 3. The *colour of the hair*.—This is stated to have been slightly different; but the difference was consistent with the hair of the remains having been buried for a year in the earth, and exposed to the action of chlorinated lime. But there are indeed so many women in the world with hair of a similar shade of colour, that no great reliance can be placed on a resemblance of this kind in a disputed case of identity. 3. The *scar*.—There was a scar or cicatrix from a burn in the right leg, below the knee. On removing the adipocere and other matter on the body, which concealed such superficial marks, it was found in a part indicated by the father of the deceased woman. The scar was distinctly puckered, and presented all the usual marks of a scar produced by a burn from a red-hot poker. 5. The *state of the uterus*.—The missing woman had had two children by Wainwright, the last having been born about nine months previous to her disappearance. From their examination of the womb, the medical witnesses for the Crown, Bond and Larkin, came to the conclusion that the woman whose remains were discovered had borne a child. On the other hand, Meadows, who appeared as an obstetric witness for the defence, stated that, in his opinion, the woman of those remains had never borne a child; an opinion which he qualified by stating that he believed it to be impossible to decide this question in any case with absolute certainty. If this witness had been able to testify positively that the indications of child-birth were certain, and could never be mistaken for an unimpregnated state of the uterus, his evidence would have gone far to show that this could not have been the body of Harriet Lane. The womb was described by Bond as much decomposed; the cavity large, but the walls thin; the os transverse and broad, and the neck projecting very little into the vagina. Larkin said that the general appearance of the uterus was most inconsistent with virginity, which fact, also, was to a great extent borne out by the appearance of the skin of the lower part of the abdomen. This showed here and there amidst the decomposition one or two white lines in the hypogastric region, and other marks of a darker colour, near to and in the inguinal region, apparently the remains of the violet lines which, together with the above-mentioned *linea albicantes*, are peculiarly characteristic, when taken in conjunction with other evidence, of delivery having taken place at some more or less remote period; and what seemed to bear out this idea more strongly was the fact, that the decomposition had progressed more rapidly with the little raised portions of integument between the cicatrix-like lines than at any other part of the whole trunk, or upper part of the thighs, where the surface of the skin was even. The dimensions of the

womb were in every way enlarged; its measurements were—extreme length, 3 inches; width at fundus, 2½ inches; cervix, upper part, 1⅜ inches; lower part, 1½ inches; thickness, ⅝ inch; length of cavity, 2½ inches; breadth between Fallopian tubes 1½ inches, centre 1 inch, lower orifice ½ inch, thickness of cervix, ¾ inch, width ⅞ inch. Its weight was 12 drachms. It was so flaccid that the most trivial manipulation sufficed to alter its shape.

In 1879, in the case of Mrs. Thomas, who was murdered at Richmond by Kate Webster, the identification of the body was made by Bond, spite of its dissection, the boiling of portions of it in a copper, and the entire absence of the head, which was never discovered.

In March, 1904, Dr. Gordon Hogg held an inquest on the remains of a woman who had been murdered and then cut in pieces and packed in cement in a box. The case gave rise to great excitement at the time owing to the murderer committing suicide when detected and to the fact that he had married some seven women and had probably murdered some of the others. There was sufficient evidence obtainable from the cemented remains to prove that death had been caused by a blow on the head.

24. **Identity when Bones only are Left.**—It is, of course, obvious that when bones and possibly a few fragments of clothes are all that are left of a human being, the great majority of points of identification, we have considered, must entirely fail us. It remains, therefore, to consider the possible questions that may arise, and what means we have still left for identification.

Naturally, the first question that must be considered is,

Are these Bones Human?

To completely and definitely answer this question, a thorough knowledge of human osteology is of course absolutely essential. The answers will be the more definite the more bones there are that are found, in fact, if only one *complete* bone is found, or skull, there should be no doubt on the matter at all. With small fragments, the answer should be given with caution, unless something in the size is decisive.

Dr. Taylor's original remarks on this subject are so much to the point and still so true, that the editor leaves them unaltered :—

"The greatest ignorance prevails among the public on this subject. The bones of horses, cows, dogs, and sheep are frequently mistaken for those of human beings. In an antiquarian collection of relics obtained from a neighbouring Roman castrum, the author saw, some years since, the tibia of a dog carefully labelled and religiously preserved as the bone of an ancient Roman. The same collection contained fragments of bones of various animals, carnivorous and herbivorous, all marked as human relics. This collection belonged to an antiquary, who had preferred adopting his own view of the nature of the relics, to taking the opinion of any one acquainted with anatomy. In a church in the north of England, two bones from oxen were shown as the thigh-bones of St. Lawrence. They were of ancient date and greatly prized by the sexton. Even well-informed men may be easily mistaken on such subjects. Belzoni, the celebrated traveller, brought from Egypt, with his sarcophagi, a number of bones taken from the interior of the Pyramids, which he pronounced to be the bones of King Cephrenes, and of some of the Shepherd kings. Clift examined them after they had been submitted to public exhibition, and he found that they were the bones of oxen. The osseous relics of saints, as they are collected and preserved in glass and crystal cases in Roman Catholic

countries, often present anomalies which would surprise an anatomist. Supernumerary ribs and vertebræ are not uncommon, and intermixed with them bones which certainly never appertained to a human being. In the medico-legal returns for India, 1868–9, it is stated that on one occasion, as evidence of an important murder, some bones brought from a distance of thirty miles, with the usual formalities and precautions as to identity, proved on examination to be those of a bullock, and on another occasion the remains turned out to be those of a goat. These facts show the importance of entrusting the examination of bones, in all judicial inquiries, to well-educated medical men. The lower classes of society are ever ready to suspect murder when bones are exhumed; and it will not always be easy to satisfy them that the bones exhumed could not have belonged to a human being.

"The lamentable effects of popular ignorance on this subject were displayed in a case that occurred at Damascus in 1840, which at the time excited great public notice. A Roman Catholic priest, with his son, suddenly disappeared in the early part of that year, and a strong suspicion arose that they had been murdered. Certain Jews were charged with having murdered the father and son for horrible purposes. The sewer in the quarter of the town in which they lived was examined, and some bones were there found. These were pronounced, by the persons who discovered them, to be human bones; and the discovery was considered to confirm the suspicion of murder which had arisen. Several of the accused Jews died under the tortures to which they were subjected. It seems that the state of anatomy was at that time so low in Syria, that there was no one in the country competent to solve the question whether these were really animal or human bones. Some persons who inspected them pronounced that they must have been lying in the sewer for a great length of time, and that they belonged to an animal. A proposition was then made that the bones should be forwarded to the Parisian Academy of Medicine for their decision. It was subsequently proved that they were animal remains. Such a case is not likely to occur in England, for there are few professional men who would not be at once able to pronounce an opinion even from the examination of one bone.

"It will be, in most cases, easier to say whether a particular bone has formed part of a human skeleton or not, than to determine to what animal it may have belonged; this is commonly all that is expected from a medical witness. A moderate acquaintance with osteology will enable him to give an affirmative or negative opinion: but where part only of the shaft of a bone—as of the humerus, radius, tibia, or fibula—is produced, some caution is required in forming a judgment. It will not be necessary in this place to describe all the peculiarities of human bones, but rather to point out certain well-marked differences which are observed to exist between the bones of man and animals." For fuller details, the reader is referred to Flowers' 'Osteology of the Mammalia' and other anatomical text-books.

"With respect to the *skull*, the foramen magnum in all animals, except the ape tribe, is placed very far back, and has its posterior edge turned upwards. In the ape tribe, and especially in the ourang-outang, it is nearer to the centre of the base of the cranium than in any other animal, and is more nearly on a level with the plane of the base of the

skull. All animals, including the ourang-outang and ape tribe, have two bones in the face, in addition to those found in man. These are situated between the superior maxillary bones, and are called intermaxillary bones, or, from their holding the incisor teeth, the ossa incisoria. The suture which separates them from the maxillary bones becomes obliterated in some of these animals at an early period; but still traces of it may be seen. To speak of the facial angle as a mark of distinction is quite unnecessary; a medical opinion can never be required except in those cases where only one bone, or the fragment of a bone, is presented for examination. The lower jaw in animals is destitute of a protuberance corresponding to the chin; it is also longer, in proportion to the cranium. The condyles of the jaw vary in shape according to the nature of the food.

"The trunk calls for no particular remark. The *vertebræ* are strikingly distinguished by their form, and by the direction of their spinous and transverse processes. Their bodies are longer, and deeply grooved laterally, in a vertical direction. The sacrum is generally narrower in proportion than in man; it is wide in those animals which occasionally stand erect, as in the ape and the bear, but it is also in these animals longer. The pelvis is in all cases much elongated, is narrower, and has less of a basin-like appearance, the level of the brim having a much greater obliquity than in man. The *thorax* of animals without clavicles is commonly compressed at the sides, so as to render it much deeper from the sternum to the spine. This is especially observed in the dog, cat, bear, and in long-legged animals. The ribs, or fragments of ribs, might perhaps be occasionally confounded. Most mammalia possess more ribs than are found in man, the number corresponding to that of the dorsal vertebræ. The ribs vary much in form, but in herbivorous animals they are generally broad and thick; in the bear and dog they are more rounded. The sternum or chest-bone of the ourang-outang somewhat resembles that of man; it is flat but narrowed, and the division of its pieces is more apparent: in all other animals it differs in being considerably narrower, more or less of a rounded form, and in being evidently composed of many movable pieces. Most quadrupeds want clavicles: they exist in the ape tribe, and very much resemble those of man, so that the clavicle of the ape might be easily mistaken for that of a young child: in the dog and cat there is a clavicular bone suspended in the muscles. The scapula or blade-bone of animals, including the ourang-outang and ape, is much longer in proportion, and is more equally divided by the spine, the fossa infra-spinalis being much smaller in proportion than in man. The *humerus*, or arm-bone of animals, is observed to become short as the metacarpus is elongated: in the ape tribe it very closely resembles that of man. In apes the bones of the fore-arm have the same general appearance as in man; but the two bones are long and slender, and the radius is as long as the ulna. In all carnivorous animals, the olecranon is extended farther back, and is more irregular than in man. The carpus, or wrist, in apes, has one bone more than in man. The size and strength of the thumb are much greater in man than in any animal. Even in the ape tribe, although separate and opposed to the outer fingers, the thumb is very small and much shorter than in the human species. The *femur*, or thigh-bone, in most quadrupeds is so

short that it scarcely projects beyond the abdomen: it varies in length according to that of the metatarsus. The neck of the thigh-bone is remarkably short, but the great trochanter rises considerably above the head of the bone even in the ape tribe. In some animals, as in the horse, the trochanter ends in an unciform process projecting above the head of the bone. In the ourang-outang, the thigh-bone is straighter than in man, while in the bear it closely resembles the human bone. The bones of the leg in the ourang-outang are nearly as in man, but the *tibia*, or leg-bone, is in general considerably longer than the femur. In the bear it preserves a proper proportion. In the ape tribe these bones are nearly of equal length. In the dog the fibula is placed behind the tibia, and is attached to it in its lower half. In the horse the fibula forms merely a kind of splinter anchylosed by age to the upper part of the tibia. In ruminants the fibula is wanting: in the pig it is anchylosed to the tibia throughout its whole length. In apes, while the great toe is shorter than the rest, the smaller toes are much longer than in man. In none of the mammalia, except man, does the foot rest completely on the ground. The os calcis generally wants the tuberosity of the heel; but this exists in the ape tribe, although to a less extent than in man."

Such are the most prominent differences assigned by anatomists to the bones of animals, and based on the observations of skeletons. It is not improbable, however, that in some cases assistance may be derived from the use of the microscope. This instrument may be especially serviceable in those cases of difficulty in which an opinion may be required from only minute fragments of bone. The Haversian canals and bone-cells (lacunæ) exist in all classes of animals which have a bony skeleton; and it has been shown that the bone-cells differ in size in the four great classes of animals. They are smallest in birds, and largest in reptiles; in the mammalia they occupy an intermediate position. In fish they are entirely different in appearance from those existing in the other three classes. These bone-cells are said to be of the same size in the same class. Thus among mammalia they are no larger in the bones of a horse than they are in those of a mouse. In human bones the cells are sometimes almost triangular in outline; at other times they have more of a linear or elongated shape. Their number is in an inverse proportion to the Haversian canals in bone. It is desirable that further observations should be made on this subject; and that differences in the microscopical structure of bone should be sought for in the human subject, and in the various orders of mammalia. Quekett ascertained that the cells of bone bear a certain relation, in point of size, to the blood-discs of an animal; thus, for instance, the blood-discs were found to be largest in reptiles, smallest in birds and mammalia, while in fishes they were of an intermediate size: and he further discovered that the bone-cells followed the same law (*Med. Gaz.*, Dec. 11th, 1846). If the microscope is required to decide whether a given piece of material is or is not bone, it is now considered quite impossible by this means alone to decide anything more than that simple question. To say that it is human is going beyond our powers; the most that can be said is, "I have compared the material submitted with a known bit of human bone, and the two are indistinguishable" (or "very different"); "it might therefore be human"

(or "it certainly is not"), "but the evidence is not sufficient to enable me to say positively that it is."

It has happened on several occasions in cases of infanticide that great difficulty has been experienced in identifying small portions of bone when the skeleton has been found partially consumed by fire.

When it has been proved that the bones are not those of a human being, this branch of inquiry is at an end.

We must now assume that the bones are human. The questions that immediately arise are—

(1) Are they those of a child or adult?—age.
(2) Are they those of a male or female?—sex.
(3) Do they represent one or more bodies?
(4) Identification from fractures and other peculiarities?
(5) Identification by hair?
(6) What was the probable stature of the person?
(7) What was his race?
(8) How long have the bones been there?
(9) Can the person be identified by the surroundings?
(10) Is there evidence of the cause of death?
(11) Identification of burnt bodies?

(1) Age in Skeletons.

We have already noted this pretty fully under the heading of "Age in Identity," and there shown that the *teeth* and the *bones* are the two most trustworthy indications of age in the dead. Of course the actual size of the bones, as well as the degree of roughness of the ridges for muscular attachments, will also give some clue to the general age. In a case of alleged infanticide there were found among the exhumed bones of two children parts of the jaws, containing the rudiments of the molar teeth, which appear about the eighth or ninth month of pregnancy. This fact showed, what was rather important to the inquiry, that the child to whom the jaw belonged must have been born at or about the full period. It may be alleged that the bones are those of a child which has been murdered; but the medical witness may be able to prove, by an examination of the jaws, that the bones must have belonged to a child older or younger than that which is missing. There are numerous other cases in which a question of this kind may become important. The determination of age by an examination of the bones of young persons is by no means so satisfactory as by the observation of the *teeth*.

When ossification is once completed it is difficult to determine the age by an examination of the bones. That the person has reached *adult age* will be indicated by the union of all the epiphyses to the bones, by the great firmness and solidity of the bones, with their rough surfaces for the insertion of muscles, their well-marked processes, grooves, and foramina. In the jaws, we may expect to find the wisdom teeth; while the other teeth will probably be found much worn, although this last sign is not of any great importance. The lower jaw forms a great angle, being somewhat of an elliptical form, and is strongly contrasted with the semicircular shape of the jaw at an early period of life. The sutures are also closed, and are found in some instances nearly obliterated.

The bones of an old person are generally lighter than those of an adult of the same size, the medullary cavities of the long bones being larger. The bones lose that ivory-looking character which they have in adults, and become yellow from the quantity of oil which they contain, more earthy, and brittle. Those parts of the skeleton which are cartilaginous in adults are commonly more or less ossified in old age. The bones of the cranium are thinner; the sutures entirely disappear, first on the inside and then on the outside of the skull. The teeth have either dropped out, or the crowns are worn away to the sockets. Sometimes no trace of alveolar cavities is to be seen, the lower jaw being a mere rounded bone, with a smooth surface on each side. There is necessity for using extreme caution in giving an opinion respecting the age of bones, and of allowing sufficient latitude in years for the bones of adults. In 1851, numerous portions of a mutilated human body, consisting of flesh and bones, were found around the suburbs of Norwich. The portions of bone found belonged to one body, and the pelvis and thigh-bone, as well as a portion of the breast and skin, showed that it was the body of a woman of adult age. The opinion then given from the bones was that the deceased was a "young adult female" between sixteen and twenty-six years of age. About eighteen years after this discovery, in 1869, a man of the name of Sheward confessed that he had murdered his wife at Norwich in 1851, that he had cut the body to pieces and disposed of the mutilated portions in the suburbs. It appeared further that his wife had really disappeared about that time, and had never been seen since; but she was a woman in her fifty-fourth year; and without some strong corroboration the man's confession could not be received against himself. The facts all concurred to show that the remains found in 1851 must have been those of the missing wife, the only circumstance opposed to this view being the medical opinion given at the time that the bones were those of a woman considerably younger than the deceased. The man was tried for the murder (*Reg.* v. *Sheward*, Norwich Lent Ass., 1869), and the medical witnesses who had given their opinion respecting age were cross-examined on this point. They admitted that the remains might have been those of the deceased woman. Indeed, every fact in the case pointed to this, and the confession of the prisoner (subsequently withdrawn) was so far confirmed, that the prisoner was convicted. There could be no doubt that a mistake had been made in limiting the age to twenty-six. The correctness of the verdict was proved by the confession of the prisoner after conviction. The mutilation had been carried to that extent that even the ring-finger had been cut off, and portions of flesh had been found which had apparently been immersed in hot water. The prisoner stated in his confession that he had endeavoured to get rid of some portions of the remains by boiling them. The same condition was observed in the *Waterloo Bridge Case* (p. 200). The state of the remains indicated death within a week or ten days of their discovery; this was also confirmed by the prisoner's confession. The prisoner, after committing the murder, occupied about a week in disposing of the mutilated remains. He cut the long hair into short portions, and scattered it to the winds as he walked along the roads.

Determination of Age from Stature.—In attempting to determine

the age of a skeleton from the measurement of the bones, it must be remembered that there is a great difference in the rapidity of growth, not merely in children of the same sex, but in children of different sexes. Sometimes a child will be much under the average stature before puberty, but will rapidly grow after having passed this period; hence the subjoined table, taken from Sue, somewhat modified by additional observations, is scarcely available for practical purposes. We must, at any rate, allow of the possible existence of great deviations.

Age.	Stature. ft. ft. in.	Age.	Stature. ft. ft. in.
At one year . . .	2 to 2 3	At fourteen to sixteen .	4 to 5
,, three years . . .	3	,, twenty to twenty-five .	5 to 5 6
,, ten to twelve . .	4		

The full stature, however, is rarely attained until the age of from twenty-five to twenty-seven years. This table refers to the stature of living persons; it will be somewhat less for the skeleton.

(2) Sex in Skeletons.

The determination of sex from an examination of the skeleton or of certain detached bones can be made only in subjects which have passed the age of puberty; for sexual differences in the skeletons are scarcely apparent until adult age has been reached. The author saw, however, the well-marked sexual differences of the pelvis in the skeleton of a boy of eleven. The skeleton of the female is smaller and more slender than that of the male. The full-grown bone of a female is distinguished from that of a male by its ridges, depressions, and processes being less marked, the shaft of a long bone is smoother and more polished, while the articular surfaces are flatter. The skull of the female is more contracted in front, and forms a longer oval from before backwards. The chest, which is shorter, smaller, and less prominent than in the male, is rather wider about the fourth rib; it then contracts somewhat below, so that, while the general shape of the chest approaches to an oval in the female, it is conical in the male skeleton, being wider at the base or lower part. The form of this cavity is often flattened laterally to a considerable extent, owing to the pressure of the stays worn by women. This altered condition of the ribs by pressure may serve to indicate the sex. The sternum or chest-bone is shorter, terminating opposite the fourth pair of ribs, but its upper portion is larger than in the male; in the latter it terminates opposite the fifth pair of ribs. The ribs are shorter, more slender, less arched, and take a more horizontal course in the female; their upper and lower borders are sharper. The false ribs are proportionately larger; and the cartilaginous portions of the true ribs are longer than in the male. The shoulders are lower, and the scapulo-humeral articulations nearer to each other. The clavicles are more slender, more round, and pass in a straighter direction to join the acromion processes. In the male they have somewhat the form of the italic *S*; they are flatter, larger, and run more directly backwards. The female scapula is thinner, smaller, flatter, and has sharper angles than that of the male. The bodies of the vertebræ are smaller; the hole for the spinal marrow is larger, as are also

the foramina; and the lumbar vertebræ have greater length than in the male.

The upper limbs are shorter, the carpus smaller, and the metacarpus and phalanges are more slender in the female than in the male. The thigh-bones have a greater curvature forwards at the upper part, and below are turned more obliquely inwards. The neck of the thigh-bone in the female forms nearly a right angle with the shaft, whereby the trochanter major is brought more nearly on a level with the head of the bone. In the male the neck of the femur is inclined obliquely upwards, and the trochanter major is below the level of the head. In the female the internal condyles are larger; and the bones of the leg are more slender and those of the feet are smaller than in the male.

The greatest difference is observed in the *pelvis*, and it is by an examination of this portion of the adult skeleton, when it can be obtained, that the sex may be most satisfactorily made out. In the female the ilia are flatter and more everted, giving to the whole pelvis a greater capacity; the sacrum is broader, and turned more backwards; the coccyx more slender, movable, and turned more backwards; the space between the pubic bones larger; and the cartilage of the symphysis broader. The angle formed by the rami pubis with the symphysis is larger. In a well-formed male skeleton the author found the angle to be 73 degrees, while in a well-formed female skeleton the angle was equal to 90 degrees. The tuberosities of the ischia are flatter and at a greater distance from each other. The brim of the pelvis is wider and of an oval form, corresponding with the head of a child, and the longest diameter extending between the ilia or transversely. In the male the brim is more circular, and the greatest diameter is between the pelvis and sacrum. The foramina ovalia in the female are wider, and approach more to a triangular form than in the male, one sharp angle being at the junction of the pubes with the ischium; the acetabula are farther distant from each other. The pelvis of the female loses some of its well-marked sexual characters in advanced life.

It will be understood that these differences are for the most part relative; and some are so slight that they can scarcely be regarded as characteristic of the sexes. Great difficulty in forming an opinion will exist in those cases where only a fragment of a bone can be procured; but a medical witness is not expected to work out impossibilities: if he has a sufficient portion of a skeleton before him, he may be able to determine the sex, otherwise it would be advisable to state that the remains produced did not enable him to answer the question, and that the bone or a fragment might have belonged either to a male or female. In a contested case of presumption of survivorship it became necessary to determine the relative weights of the adult male and female skeletons. A perfect male skeleton was found to weigh ten pounds six ounces, and a perfect female skeleton eight pounds thirteen ounces. The bones were completely dry. It may be observed that bone is the densest part of the human body, its specific gravity being 2.

Perfect has reported a case which shows the importance of attending to *sex* in exhumed skeletons. Two brothers lived together on a farm. The younger of the two was dissolute and irregular in his habits, so that they lived unhappily.

One winter's night, when the ground was covered with snow, the younger brother absconded from the house by letting himself down from his chamber window; and when he was missing the ensuing morning, his footsteps were clearly traced in the snow to a considerable distance, but there were no footsteps of any other person. Nothing was ever afterwards heard of the missing brother. The elder brother left the farm, and it passed into the hands of a stranger. During the progress of some alterations in the grounds surrounding the house a skeleton was dug up. It was immediately conjectured that the one brother had murdered the other; an investigation was called for, and an inquest was held. Perfect, who was not summoned as a witness, requested permission to examine the bones. Having disposed them in their natural order, he found that they represented a person of short stature; and from the obliteration of the sutures of the skull, and the worn state of the crowns of the teeth, he inferred that they must have belonged to an aged person. On examining the bones of the pelvis, it was perceptible that they had belonged to a *female*. When this fact was communicated to the jury, the two medical men, who had given their opinions from a hasty examination, were sent for, and one of them immediately corroborated the statement that the skeleton had belonged to a female. The proceedings were of course at an end, and a heavy suspicion, amounting to a charge of fratricide, was thus removed from an innocent man. On further inquiry, it was ascertained that the bones had been removed from an old gravel-pit, where gipsies had been accustomed to assemble and occasionally bury their dead.

(3) Do they Represent one or more Bodies?

This point is too obvious to require to be much dilated upon, but it is nevertheless a most important one. In old graves there will naturally be a greater chance of multiple burials than in the cases where a murderer has disposed of his victim. Still it is possible that two or more people (generally, of course, children in such cases) may have been murdered at the same time.

The only way in which the point can be determined is by finding either too many bones of one name to have belonged to one individual, or by finding more bones of one side of the body than one individual could have possessed. Polydactylism must not be forgotten.

(4) Identity of a Skeleton from Disease, Fracture, and Peculiarities.

The existence or non-existence of *fractures*, and the progress which may have been made towards ossific union, may also become an important subject of inquiry. The body of Dr. Livingstone was identified by means of an old fracture of the humerus. In general the past existence of a fracture is easily determined in an exhumed bone by the appearance of a knot or ridge, or in some cases a thick deposit of bone where union has taken place badly. In a fractured bone which has united in a curved form, it will be observed, on making a section, that the shell is considerably thicker on that side which has had to bear the greatest weight or pressure. All these facts, trivial as they may appear, may in reality be material in a case of disputed identity; and unless carefully observed at the time, valuable evidence may be lost.

Questions of identity in relation to skeletons may be in some cases solved by reference to certain special characters of the bones. They may have about them indications of disease, as rickets, softening of the bones, or syphilis. There may be, again, some personal peculiarities, such as the presence of supernumerary fingers or toes,

which, if observed, may tend to throw some light upon the case. An instance of this kind is mentioned by Orfila. In the year 1823, a man named Bonino, who had been residing in a small village in the neighbourhood of Montpellier, suddenly disappeared. It was some time afterwards reported that he had been murdered by a girl with whom he had cohabited and by a man of the name of Dimont, who was known to have been for some time her associate. It was only in the year 1826, after the lapse of more than two years, that the magistrates were first induced to direct an investigation of the case. A strict search was ordered, and the remains of a body, chiefly the bones, were found buried in the garden of Dimont, who had married the girl nine months after the disappearance of Bonino. It was of course essential to identify this skeleton as that of the deceased. It was well known that he had laboured under a singular personal deformity in having a sixth finger on the right hand and a sixth toe on the left foot. The bones, which were nearly all perfect, were carefully removed and put together, when it was found that those belonging to the two smaller toes of the left foot were wanting; but the metatarsal bone of the fifth toe had a process on the outer side, with a small articulating surface, which might have formed a supernumerary joint. Still, however, this was considered insufficient to establish the point, and the attention of the examiners was then directed to the right hand. The fifth bone of the metacarpus was shorter and broader than the one belonging to the opposite hand, while its digital extremity was divided into two parts, of which one formed a smooth, rounded articulating surface in the axis of the bone; while the other, which presented a more flattened articular surface, formed with it an angle of about eight degrees. On attempting to articulate the first phalanx of the little finger, it fitted exactly the first articular surface, and presented on the outer side a distinct groove, the oblique direction of which coincided with the direction of this second surface. This left no doubt of the nature of the peculiarity of structure, although the phalanges of the sixth finger could not be discovered. The left hand and the right foot were complete in all their parts. Other corroborating circumstances transpired with respect to the marks of violence on the body, and the two prisoners were tried, condemned, and executed. (For other cases see "Ann. d'Hyg.," 1863, 2, 114.)

Deformities of the spine, whether from old tubercle, mollities ossium, rickets, etc., or limbs, from fractures or bony anchylosis of joints, are easily observed, and may form well-marked points of identity. Briand mentions the following case. In 1825 a man named Guérin suddenly disappeared. Three years afterwards an excavation was made in the cellar of the house where he and his brother had resided, and some human bones were discovered. Among other circumstances, the medical men to whom the examination of these bones was referred remarked that the body of the fifth lumbar vertebra was depressed and thin, as it is met with in rachitic individuals; that the pelvis was more contracted on the left than on the right side; that the tibia and fibula of each leg presented a remarkable curvature, greater, however, on the left than on the right side, so that the left leg was half an inch shorter than the right. There were certain

peculiarities about the teeth of the lower jaw, the canines forming a considerable projection in front of the incisors. These facts, together with other circumstances, established the identity of the bones as being those of the person who had been missing.

(5) Identification from Hair.

Under natural processes of decay hair is very indestructible. Therefore, in the exhumation of remains, portions of *hair* may be found on or about the skull, or in the earth surrounding it. The hair should be separated by washing it first in water, and afterwards in a mixture of distilled water and acetic acid. When dried on paper the colour will be observed, and this may be of some value in determining a question of identity. French medical jurists lay great stress upon the necessity for determining whether the hair has been artificially dyed or not. The common hair-dyes are compounds of lead, silver, or bismuth; and these metals, when the necessity arises, may be sought for, and easily found, by processes similar to those required for their detection as poisons when absorbed into the tissues (*vide* pp. 172 *et seq.*, where hair and its examination is discussed).

(6) Stature of a Person Determined by the Size of Skeleton or from Single Bones.

The average stature of Englishmen is from five feet six to five feet nine inches, or, according to Galton ("Life Hist. Album"), five feet eight inches; about four out of one hundred are calculated to have a stature of from six feet to six feet three inches. In determining the stature from the measurement of the entire skeleton, it is usual to add from an inch to an inch and a half for the thickness of the soft parts. When the bones are entirely disarticulated they should be laid out in their natural order, and an estimate made. Medical jurists have endeavoured to determine the stature of a skeleton from the measurement of one or more of the long bones, as, for example, of the femur, tibia, fibula, humerus, radius, and ulna; but the rules for this mode of calculation are unsatisfactory; and, as Devergie has shown from the tables, they are liable to lead to an error of five inches at the least. The fact is, there does not appear to be any uniform relation between the length of these individual bones and the stature of a person. In tall persons it is observed that the bones of the lower limbs are proportionably longer than those of the upper; but we are liable to meet with all kinds of anomalies, and the best that can be said of this mode of measurement is, that it can never be proved wrong; for in general there can be no witness to speak to the stature of the person while living in cases in which a medical investigation of this kind is directed to be made. We advance very little to a solution of this question even by deducing the average length of a long bone from a measurement of a large number of similar bones. The difference in the length of the bones will be great according to whether the measurement is made from the edge of one articular surface to the other, or whether the processes are included or excluded, such as the styloid process of the ulna and the inner malleolus of the tibia.

Below are drawn up the measurements of three adult male skeletons,

which were taken as accurately as possible by the repeated examination of the numerous skeletons in the museum of Guy's Hospital. Nos. 1 and 2 comprise nearly the average stature of Englishmen; No. 3 represents the skeleton of a tall man. The height here is the bare measurement of the bones with the soles of the feet resting on the ground; an addition of at least an inch should be made for the soft parts. The lengths of the tibia and fibula were taken between the articular surfaces. From end to end the fibula is a remarkably long bone. The author has found it in adults to be in many cases as long as fifteen inches.

Adult Male Skeletons

	No. 1. ft.	No. 1. in.	No. 2. ft.	No. 2. in.	No. 3. ft.	No. 3. in.
Stature (sole on the ground)	5	6	5	9	6	0
Transverse measurement from extremity of middle fingers	5	$6\frac{1}{2}$	5	$10\frac{1}{2}$	6	1
Femur		$17\frac{3}{8}$		18		$19\frac{1}{2}$
Tibia between art. surf.		$15\frac{3}{8}$		$14\frac{3}{4}$		$15\frac{1}{2}$
Fibula between art. surf.		$13\frac{1}{2}$		14		$14\frac{1}{2}$

	No. 1. inches.	No. 2. inches.	No. 3. inches.
Humerus	12	12	$13\frac{1}{4}$
Radius	9	$9\frac{1}{4}$	$9\frac{3}{8}$
Ulna	10	$10\frac{3}{8}$	$10\frac{3}{8}$
Clavicle	$5\frac{6}{8}$	6	6
Hand from carpus, joining the radius	7	$7\frac{1}{4}$	$6\frac{1}{2}$

The subjoined table contains the measurement of two female skeletons, the one of an adult, the other of an aged woman:—

Female Skeletons.

	Adult Female. ft.	Adult Female. in.	Aged Female. ft.	Aged Female. in.
Stature	5	$2\frac{1}{2}$	5	0
Transverse length	5	$2\frac{1}{2}$	5	$0\frac{3}{4}$
Femur		16		16
Tibia		$12\frac{3}{4}$		$12\frac{1}{2}$
Fibula		$12\frac{1}{2}$		$12\frac{1}{4}$
Humerus		$11\frac{1}{8}$		$11\frac{1}{4}$

	Adult Female. inches.	Aged Female inches.
Radius	8	$7\frac{7}{8}$
Ulna	9	$8\frac{3}{4}$
Clavicle	$5\frac{1}{2}$	5
Hand from the wrist	$6\frac{1}{2}$	$6\frac{1}{4}$

These are the measurements of the bones of the arm of a well-formed soldier:—

Arm of a Soldier.

	inches.
Humerus	$12\frac{1}{2}$
Radius	$9\frac{1}{4}$
Ulna	$10\frac{1}{4}$
Clavicle	6
Hand from wrist	$7\frac{3}{8}$

	inches
Total length of arm	$29\frac{1}{2}$
$29\frac{1}{2} \times 2 = 59$	
Clavicles 12	
Sternum $1\frac{1}{2}$	
Stature about 6 feet.	

The following are full-length measurements of perfect but detached bones of a male skeleton used for anatomical demonstration:—

Detached Bones of a Male Skeleton.

	inches.
Femur	18
Tibia	$15\frac{1}{4}$
Fibula	15

	inches.
Humerus	$12\frac{3}{4}$
Ulna	$10\frac{1}{4}$
Radius	$9\frac{1}{4}$

In the course of these investigations an attempt was made to determine whether there was any correspondence between the transverse length of the skeleton measured from the extreme ends of the phalanges of the middle fingers, the arms being maintained in a horizontal

position. It will be seen that both in the male and female there is a very near approximation in these measurements. We have only the bones of the arm of a male adult; we may by doubling its length, and adding twelve inches for the two clavicles and an inch and a half for the sternum, determine approximately the stature. Thus, by applying this rule to the arm of the soldier of which the measurements have been just given, we should have a stature of six feet. This method of taking a whole extremity, although only approximate, is likely to lead to less error than that of determining the stature by the measurement of a solitary bone. In the disinterment of the remains of William Rufus, an attempt was made to determine the stature of the king. The tibias were each sixteen and a quarter inches long, the thigh-bones were nineteen inches, and the spine was twenty-six inches in length. Comparing these measurements with those above given, the inference is, that Rufus was a tall man, nearly, if not quite, six feet in height.

Below are two measurements, the one of a male skeleton between *ten and eleven years of age*, the other of a mature child at the end of *nine months'* uterogestation. The dried cartilages at the ends of the long bones are not included in the measurement of the latter, because they are never found in graves; we have merely the osseous portions to examine.

	Male Skeleton naturally articulated. ft. in.	Mature Child at 9 months. inches.		Male Skeleton naturally articulated. inches.	Mature Child at 9 months. inches.
Stature	3 10	19¾	Ulna	6¾	2¼
Femur	11¾	3	Clavicle	4	1⅝
Tibia	9¾	2⅝	Hand from wrist	5	2
Fibula	9½	2½	Arms each		8¼
Humerus	8½	2¼	Measurement across the chest		3¼
Radius	6	2			

Béclard remarks on the stature of the body, as determined by the dimensions of the skeleton, that it is about five feet four inches for an adult male and about five feet for an adult female; but it is subject to great variation, not merely in the various races of men, but in individuals of the same race and nation. The extremes, however, are comprised within certain limits. Thus dwarfs (as adults) are rarely less than one-half of the average stature, while giants are seldom more than one-half above the average.

The following tables are taken from Tidy's "Legal Med.," p. 170:—

Average Measurement at different Ages, reduced to a Scale of 100.

Age.	Height.	Spine.	Circumference of Skull.	Humerus.	Radius.	Hand.	Femur.	Tibia.	Foot.	Pelvis.	
										Transverse Diameter of	Antero-posterior.
Birth	100·00	36·84	79·00	18·50	13·20	16·30	22·60	18·50	18·50	6·80	6·80
2 years	100·00	31·48	65·55	17·40	13·33	11·48	22·94	18·88	13·33	8·14	8·14
4 to 6 years	100·00	33·71	51·42	18·85	13·71	11·71	26·00	20·28	14·57	7·14	7·14
8 to 12 years	100·00	29·76	43·72	19·30	14·09	11·86	26·51	21·86	14·65	7·21	7·21
15 years	100·00	30·74	35·70	19·25	13·70	10·55	27·40	21·48	14·81	7·03	6·66
18 to 19 years	100·00	30·83	33·00	19·00	14·33	11·11	26·33	22·16	13·83	7·83	7·50
Adult	100·00	34·15	31·54	19·54	14·15	11·23	27·51	22·15	16.03	8·00	6·61

Orfila's measurements show in many respects remarkable differences from those given by Dr. Humphry. They are, however, often quoted, and we reproduce both his tables, chiefly for the purpose of showing that the medical jurist must not be too dogmatic on the relative length of bones.

TABLE I. (Orfila's First Table).

Stature calculated from Length of Bones.

[The measurements are given in inches and fractions of an inch.]

Length of Bone.		Stature.		
	Inches.	Maximum.	Minimum.	Difference.
Humerus (19 obs.) . .	14·50	68·10	64·50	3·60
Ulna (14 ,,) . .	10·66	70·80	65·66	5·14
Femur (12 ,,) . .	17·75	69·66	64·50	5·16
Tibia (11 ,,) . .	14·21	69·66	64·50	5·16

TABLE II. (Orfila's Second Table).

Stature calculated from Length of Bones.

Length of Bone.		Stature.		
	Inches.	Maximum.	Minimum	Difference.
Humerus (6 obs.) . .	13·00	73·25	69·75	3·50
Ulna (7 ,,) . .	10·66	73·25	65·00	8·25
Femur (7 ,,) . .	18·10	72·00	67·00	5·00
Tibia (7 ,,) . .	15·00	70·50	65·00	5·50

M. de S. Luca brought before the Academy of Sciences the results of his researches on the relative length and weight of the bones which constitute the human skeleton (*Cosmos*, October 2nd, 1863, p. 386). He demonstrated the existence of relative proportions among parts of the body which had not previously been suspected. His view is, that in the construction of animals there is among the various organs a uniform relation of weight, length, and surface. The average stature of an adult man is, according to him, five feet three inches (1 mètre 60 centimètres), that of an adult woman one-twentieth less, *i.e.*, five feet. The head forms one-eighth part of the total height of the body; this is divided into two equal parts immediately below the eyes, while the nostrils are midway between the eyes and chin. In a vertical section of the body, the pubis is a central point between the two extremes. When the arms are raised vertically above the head, the umbilicus or navel, which is one mètre (39·37 inches) from the sole of the foot, then becomes the centre of the length. It may be further remarked that the height of a man corresponds to the distance which separates the extremities of the two hands when the arms are extended in a horizontal line from the body. The arm

may be divided into five parts, the hand representing one part, while two others are occupied by the forearm, and the remaining two parts by the upper arm, the elbow being the boundary of these divisions. Whatever the length of the hand, five times that length will represent the total length of the arm, so that if the hand is 133 millimètres (5·24 inches) the arm will be 665 millimètres (26·18 inches) in length. In reference to the hand, the carpal and metacarpal bones represent one-half of its length. The first phalanx of the middle finger is equal to one-fourth of the hand, and the two last phalanges of this finger, taken together, are exactly equal to the length of the first phalanx. The last phalanx is itself naturally divided by the nail into two equal parts. The sole of the foot is a third longer than the palm of the hand, but the back of the foot or instep is of the same length. The observations made on the weight of the bones showed :—(1) that the bones of the right side of the body are heavier than those of the left. (2) The weight of the bones above the navel is equal to the weight of those which are below that point. (3) The weight of the bones of the hand is equal to the fifth part of the weight of the bones of the arm. There is the same relation here as in length. (4) The total weight of the hand may be divided into five equal parts, one represented by the carpal, two by the metacarpal bones, and two by the bones of the fingers. The first phalanx is equal to two-thirds of the weight of the entire finger, the other third being represented by the two remaining phalanges. (5) The bones of the hand are equal to half the weight of the bones of the foot. (6) In the foot there are similar relations. The weight of the tarsal is double that of the metatarsal bones, and the weight of the toes is divided into three parts, two for the first phalanges and one for the two small phalanges.

(7) Determination of Race from Skeleton.

There are certain differences in the skeleton according to whether it belongs to an individual of the Caucasian, Mongolian, or Negro race. The differences chiefly relate to the proportion which the skull bears to the face, and the relative lengths of the upper and lower extremities. For remarks on these differences *vide* p. 105, where race in identity is discussed. The question is only likely to arise in seaports, though, of course, it might occur in other parts where foreigners were known to have lived. From the mixed nature of the population in England, and especially in London, Liverpool, etc., it is, perhaps, not unlikely that cases may arise in which race becomes very material for guilt or innocence.

(8) How Long have the Bones been Interred?

One of the first questions asked on the disinterment of bones relates to the length of time during which they have remained buried in the ground. The period at which the bones begin to undergo decomposition will depend upon that at which the soft parts have entirely disappeared. The common opinion is, that the soft parts are destroyed in ordinary graves in about ten years. Bernt, however, mentions a case seen by Navier in which some fleshy parts of the body remained after an interment of twenty-one years. The changes

in the bones are observed to commence by the loss of animal matter, so that they become lighter; externally they acquire a dark incrustation when in contact with the earth. This dark incrustation is sometimes confined to the surface; but in some very ancient bones the osseous shell is of a dark brown colour throughout, like old oak. The animal matter is never entirely lost; it exists in bones which have been buried for many centuries, and may be made evident by digesting them in hydrochloric acid. Even in sawing them, the heat developed by friction brings out a peculiar animal odour. The shaft of a long bone becomes, after long burial in a dry soil, light and very brittle; it may be easily broken, and cut or scraped with a knife. It appears to be impossible to assign, with any approach to precision, the period required for the production of these changes; they vary with the age of the subject, taking place more rapidly in the skeletons of the young: they vary also with the nature of the soil in which the bones are buried, according to whether this is dry or humid, sandy, cretaceous, or clayey. Some have alleged that the bones of a person buried in an ordinary coffin are entirely destroyed, with the exception of the skull and thigh-bones, within a period of thirty years; but there are cases on record where the skull and long bones, and even the perfect skeleton, have been found in ordinary graves quite perfect after a much longer period. In general the lower jaw of adults is preserved for a great length of time, and with it the teeth, which from the hardness of the enamel resist decomposition longer than any other parts of the body. The ultimate destruction of the bone is effected by the complete disintegration of its earthy parts, the phosphate and carbonate of calcium falling into and mixing with the earth around. Bones owe their preservation to the large proportion of mineral matter contained in them. This is greater in the adult than in the child. Von Bibra found the following proportions of mineral matter per cent. in recent bones of different ages: in a woman (æt. 62), 69·82; in a man (æt. 25), 68·97; in a child (æt. 5), 67·80; in a child of two months, 65·32; in a fœtus of seven months, 65·19; and in a fœtus of six months, 59·62. The proportions in the bones of animals are similar to those of the human adult.

On the discovery of a bone, or a skeleton, the question may be: Can it have been buried for a longer period than fifteen or twenty years? Suspicion may arise that the bones were those of a person alleged to have been murdered, and who had disappeared about that period. In some cases this question may admit of a ready answer. If it were the long bone of an adult, and it was found to be light, friable, brittle, and easily scraped to powder, it is probable that it had been interred for a much longer period than that above mentioned. We can form only a rough opinion of the period of interment of bones by the presence or absence of the soft parts, of marrow in the interior; by the firmness and weight or brittleness, dryness, and lightness of the bone. Even these remarks can scarcely be made applicable to bones preserved in durable coffins or vaults; for in this state they are, to a great extent, removed from all the common causes of chemical change. Devergie states that the bones of King Dagobert were found in a tolerably perfect state at St. Denis, although they had been buried in a vault twelve hundred years. In the year 1868 the skeleton of

William Rufus was found in a stone coffin at Winchester, nearly perfect, after 780 years' burial. The skull was in fragments; the vertebræ were almost complete; parts of the pelvis and sacrum (showing the male characters), the bones of the arms, the femoral bones, and two tibiæ were found. The lower jaw, with nine teeth, the enamel apparently unchanged, was also discovered. There were no clavicles and only six ribs, and the small bones of the hands and feet had disappeared.

In 1868, the author examined a portion of the scapula and rib of a skeleton which was found eighteen inches below the surface in the sandy soil on the top of a hill. The skeleton, which was that of a female, was perfect, excepting the lower ends of the tibiæ and feet, which were decomposed. It had the appearance of having been thrust violently into the ground. There were no traces of soft parts. The teeth in the upper jaw, including the wisdom teeth, were perfect and regular, and the age was considered to be from twenty-three to twenty-eight years. No hair or articles of clothing were discovered. On analysis the bones were found to contain 72 per cent. of mineral matter, and the presence of fluorine was detected in a small quantity of bone reduced to powder. The date of interment was assigned at from fifty to one hundred years.

A question which has yet to be determined is whether, as with the fossil remains of animals, human bones after long interment may not contain a larger proportion of fluoride of calcium than when recent. It has been ascertained that the ancient bones of extinct animals contain a large proportion of fluoride, while in recent bones the proportion is so small that it requires a large quantity of bone to determine its presence. These medico-legal questions are likely to arise only in those cases in which the bones have been found under suspicious circumstances in an unusual locality, as in the cellar or basement of a house, or in a garden; and it will always be proper to make further exploration to see whether the bones of different persons may not be found lying near.

Bones and teeth which have been long buried may, by percolation of water through the soil, become impregnated with ferric oxide, sulphate of calcium, or carbonate of calcium and magnesium. They are heavy, of a dark brown colour, and generally contain much lime and iron, with fluoride of calcium. In some bones, disinterred near one of the plaster quarries of Paris, Lassaigne found, besides 66·7 of the usual mineral constituents, 2·3 per cent. of sulphate of calcium, with traces of ferric oxide. Other bones, of soldiers killed in 1814, and buried near the same spot, yielded 56·1 of phosphate and carbonate of calcium, 0·5 of sulphate, and 8·2 per cent. of argillaceous sand. These bones had been buried for a period of thirty-three years. They contained 15 per cent. of animal matter and 20 of water. Those taken from the plaster quarry contained the same quantity of water, but only 11 per cent. of organic matter (*Ann. de Chim.*, 1847, p. 759).

(9) Can the Body be Identified by its Surroundings?

The discovery of certain articles of clothing known to have belonged to a missing person in association with the bones of a

skeleton will sometimes remove any doubts that may arise on the subject of identity (see case of Miss Holland). Metal buttons, brooches, or rings, are imperishable, and should be sought for by sifting or washing the earth.

In *Reg.* v. *Platts* (Derby Lent Ass., 1847), the prisoner was charged with the murder of a man named Collis. The deceased had not been seen alive since December 7th, 1845. On August 28th, 1846, some men, in cleaning out a cesspool in the neighbourhood, found some human bones with certain articles of dress, which were supposed to be those of the missing man. Besides the ribs, there were two thigh-bones and two leg-bones. The flesh readily came off the bones and fell into the soil. With these remains, there was the ordinary dress of a man—namely, coat, hat, trousers, neckerchief, and two garters, one red and one white. These were still around the bones of the legs. Walker stated that he had examined the bones, and found them to be those of a male human being, from twenty-three to thirty years of age. All the bones were complete, excepting a few belonging to the neck, and three ribs. There was a deep fracture of the skull in the region of the forehead five inches in extent, another fracture over the left eyebrow, and a third across the base of the skull. These fractures, in his opinion, were inflicted on the body while living. The other bones, which appeared to have been separated by the yielding of the ligaments as a result of putrefaction, presented no marks of violence. The injuries to the skull were produced by some cutting or sharp-edged instrument, and were sufficient to cause death, which might have taken place either immediately or after some time. The clothes were identified as those worn by the deceased at the time of his disappearance, and the white and red garters found round the leg-bones were identified by a woman who made them, and gave them to the deceased.

The prisoner was connected with the act of murder by a chain of circumstances. On December 7th he was seen with a hammer in his hand quarrelling with the deceased. At a later period he was seen with two men pushing the deceased, who appeared to be in a stupefied state, into his shop. On the night following he was seen in company with two men carrying a heavy substance in a sack in the direction of the cesspool in which the skeleton was afterwards found. The prisoner had made false statements respecting the transactions between himself and deceased, and the watch and boots of the deceased were traced to his possession. The deceased had been seen with the watch up to within half an hour of his disappearance.

For the defence it was contended that there was not sufficient proof in law that the remains found were really those of the missing man. The finding of some portions of the clothes of the man in the cesspool was not sufficient to prove the *corpus delicti*—the murder. There must be positive evidence that the remains were those of Collis. Patteson, J., overruled the objection, observing that the identity of the remains was altogether a question for the jury. It was further contended for the defence that there must not only be clear proof that the remains were those of the deceased, but it must be proved that the deceased had died by the act of the prisoner, and not from any accidental cause. The prisoner was convicted.

But for the discovery of the clothes, more particularly of the two different-coloured garters round the leg-bones, the identity in this case could not have been satisfactorily established. The suggestion that the deceased might have fallen into the cesspool by some accident was negatived by the fact that, had this occurred, the watch and boots would have been found with the remains, whereas these articles were traced to the possession of the prisoner. It is worthy of note that in this case the dead human body, in clothes, was reduced nearly to the state of a skeleton within the short period of nine months. This must be ascribed to the influence of the putrescent animal matters by

which it was surrounded. That the bones had not been for a longer period in the place where they were found was proved by the fact that the cesspool had been cleared out only a short time before the disappearance of the deceased.

In July, 1863, the bones of a child were found in a nursery-ground at Islington, under suspicious circumstances. It appeared that a girl named Elizaboth Hunter, aged eight years, had been missing from the neighbourhood since March 30th, 1862, and it was important to establish, if possible, that these were the bones of a female child of the age of the deceased. Until the skull was found it was supposed that the bones were those of a dog, but their human character appears to have been ultimately established by the discovery of the skull with some hair, and also of the lower jaw. The medical witness at the inquest assigned the age at from eight to ten years, but could not well define the sex, as at this early period the sexual differences on the pelvis are not well marked. The articles of clothing found with the body served, however, to establish the sex, as well as the identity of the bones with those of the missing child. The remains had the appearance of having been longer in the earth than sixteen months, but it seems they were only superficially covered, and this might account for the rapid destruction of the bones and soft parts. It is probable that the bones of young persons decay more rapidly than those of adults.

Other points of circumstantial evidence also demand attention—the position of the bones when discovered in the ground, whether lying at full length or grouped together confusedly. In bodies which have undergone Christian burial, the skeleton is found lying at full length, usually with the head to the west and the feet to the east, and one skeleton may be found below another. By an attention to these points the locality has been at once identified as the site of a burial-ground, where bones have been discovered during excavations for the foundation of new buildings. This inference is confirmed when the bones of persons of all ages and both sexes are found in or near the same spot. In 1866, a remarkable discovery was made at Milcote, near Stratford-on-Avon. Within two feet from the surface of the soil upwards of two hundred human skeletons were found. They were placed closely side by side upon their backs, with their feet to the east and their heads to the west, and all were well preserved. There were young and old, and skeletons of both sexes, the bones presenting no marks of injury from weapons. This was no doubt the site of an ancient but long-forgotten burial-ground. In prehistoric times the body was consigned to a stone chest in a sitting posture, with the arms clasped about the knees. Thus, in these ancient graves, the skeleton has been discovered with the thigh-bones folded on the chest. It is not unusual to find human mixed with animal bones. The author procured from a deep grave in an old cemetery the bones of a horse mixed with the bones of a male human skeleton. Occasionally, in ancient times, this animal was killed and buried with his deceased owner; and probably the disinterment of these bones in old burial-grounds has given rise to the fables of giants. In one cemetery in the vicinity of London, the bones of the horse were frequently found when the excavations were carried on to a great depth. The bones of the ox have also been met with in graves mixed with human bones. The author had sent to him the upper part of the thigh-bone of an ox, which was dug out of a deep grave in a country churchyard; it was forwarded to him as an unusually developed thigh-bone of a human being.

(10) Can the Manner of Death be Cleared Up?

Indications of murder or violent death may be obtained long after the entire destruction of the soft parts. Briand relates the case of a woman whose body was disinterred after eleven years' burial. It was believed and alleged that she had been murdered, and her body afterwards buried by her murderers. This was found completely reduced to a skeleton, but nevertheless the third, fourth, fifth, and sixth cervical vertebræ were still held together by a dark-coloured mass derived from the decomposition of the fleshy parts of the neck; and this mass was still surrounded by several folds of a cord, which had been employed as the means of strangulation. Proof was thereby obtained of the mode in which the murder had been perpetrated. It was also possible to determine the length and colour of the hair, the state of the teeth, and the form and length of the bones. A ring was found on the bones of one finger, which left no doubt whatever of the identity of the deceased.

In 1829, a man named Guérin was condemned at the assizes at Versailles for the murder of his brother. The murder had been perpetrated on August 21st, 1825, and the body had been buried in the corner of a damp cellar. The exhumation of the remains took place three years after interment, and it was ascertained by inspection that the deceased had been destroyed by blows on the cranium with a bruising instrument of large surface, and the identity of the deceased was clearly made out by the disposition of the teeth, the malformation of the vertebral column, and the curved form of the bones of the legs.

The case of Eugene Aram also furnishes an instance of the necessity for closely examining skeletons when it is suspected that the individuals have died from murderous violence. This man conspired with another to murder a person named Clarke. The deceased suddenly disappeared in February, 1745, and his absence could not be accounted for. In 1758—*i.e.*, thirteen years after his disappearance—some bones were accidentally discovered in a cave near the town where he lived. Aram's accomplice was arrested on suspicion; and, losing his presence of mind when charged with the murder, he denied that those were the bones, but mentioned the spot where the bones of Clarke were buried. A skeleton was there found, and the traces of a fracture and indentation of a temporal bone were plainly perceptible. The manner in which the murder was committed was confessed by the accomplice, and the medical evidence corroborated this confession. Aram, who was a man of some ability, argued in his defence that it was impossible to identify a skeleton after the lapse of thirteen years; that the fracture of the skull and the piece of bone beaten inwards proved nothing; that it might have lain long in the cave where it was found, which had been a hermitage, and therefore a likely place of sepulture in ancient times; and that the violence to the skull might have been produced in times of disorder, when in searching for treasure the graves and coffins of the dead were violated. He also positively denied the conclusions as to the sex of the skeleton; but this objection was entirely set aside by the medical evidence. In spite of the ingenuity of this defence, the facts were too strong against him, and he was convicted and executed.

Aram's defence throws some light upon the questions of doubt which are apt to arise when evidence is given from the examination of exhumed bones. Thus, for example, we find three points strongly urged involving the consideration of the time required for the destruction of the skeleton, and therefore of its identity; of the form, situation, and appearance of a fracture of a bone, so as to enable a medical witness to determine whether it be of recent or of old standing, and whether it was likely to have been caused by accident previously to or during the exhumation, or had arisen from the direct application of violence to the skull during life. Lastly, a clear determination of

the sex may be required from an examination of the bones. This, of course, is material to identity, and therefore one of the first circumstances to which a medical witness should direct his attention.

In 1903, what was known as the Moat Farm mystery excited very great interest (*Rex* v. *Dougal*, Chelmsford Ass.). The facts were as follows:—Dougal, already a married man, persuaded a Miss Holland to live with him at the Moat Farm. It was proved in evidence by a servant that Miss Holland left the house with the prisoner one day in August, 1899, and was never again seen alive. Various excuses were made by the prisoner to account for her non-appearance. Meanwhile the prisoner proceeded to deal with her property, and was arrested for forging the dead woman's name to a paltry cheque for a few pounds.

Inquiry led the police to believe that Miss Holland had been murdered by the prisoner, and her body disposed of by burial somewhere near the farmhouse. After prolonged search the remains of a human body were found buried in the bank of a ditch which the prisoner had caused to be filled in, upon the site of which he had had trees planted. Little but the bones, a few fragments of personal attire, the boots and traces of internal organs, was found, but there was enough to convict the prisoner, who was hanged. The main items of proof of identity and of the mode of death were the following: (1) portions of a skirt: this was identified by the deceased's dressmaker, who was able to swear to a peculiar mended portion of it, the witness having herself mended the skirt in the manner which was found; (2) a comb or hair fastener of a pattern which Miss Holland's maid was able to swear to; (3) remains of boots of a peculiarly small size, precisely corresponding to the size which deceased was known to have worn: they were of French make, and were distinctly identifiable; (4) the skeleton was that (*a*) of a woman, (*b*) of a person about the height which Miss Holland had attained to; (5) behind the position of the right ear was found a jagged fracture of the bone, with fragments carried inwards; the brain was sufficiently preserved for Professor Pepper, who performed the autopsy, to trace a wound through it from behind forwards and to the left, at the anterior end of which wound was found a bullet. With regard to proving that the bullet was one which might have been fired by the prisoner, there was some little difficulty so long after the event, but there could be no doubt whatever that the person whose remains were found had been killed by a bullet fired from behind, and the circumstantial evidence was sufficient to prove (*a*) that the body was that of Miss Holland, and (*b*) that the prisoner was the only person who could have fired the shot, and (*c*) that he had opportunity and motive (!) for doing so.

For the following case the editor is indebted to Dr. Nelson Hardy; it occurred to him a few years ago:—

The case was one of supposed manslaughter of a child, whose bones were dug up by degrees from under the ground floor at the back of a small house, which, having been untenanted for months, had become again inhabited; the new tenants found a bad smell in this one room, which led to the floor being taken up. By degrees we got the bones arranged in the following order:—

Bones of Head and Face.—Occipital, two temporal, with light brown hair attached; frontal in two pieces, with brain substance converted into adipocere; sphenoid, part of; superior maxilla in two pieces, with molar tooth not erupted; inferior maxilla with molar tooth unerupted on each side.

Upper Extremities.—Two scapulæ, two humeri, two ulnæ in four pieces, one radius, two clavicles, five phalanges.

Spine and Body.—Eight pieces of vertebræ, thirty-eight ribs and pieces of ribs.

Pelvis and Lower Extremity.—One ilium, two femurs, two tibiæ, two fibulæ.

Additional bones were afterwards dug up, and, as if on purpose to confuse us, some pieces of bone of a lower animal also appeared (probably ham bones), as well as two large iron nails, one with light brown hair adherent to it.

The points which we were able to make out were—(1) that we had here the greater part of the skeleton of a child which, from the unerupted teeth, we judged to have been about two years old; (2) that from the formation of that curious product of decomposition adipocere it had probably been buried for some months; (3) that there was no evidence to show how it came by its death. As the charge

of manslaughter could not be sustained, the former tenant of the house, who had had a child corresponding in age to this one, was acquitted of that, and pleaded guilty to the minor offence of concealment of death.

In reference to injuries found in skeletons, it is obviously of great importance to attempt to determine whether the injury had occurred during life or by accident during the exhumation, and if during life, whether it were recent or of old standing. In most cases this will be of extreme difficulty, but if osseous union has taken place this will still remain and will prove definitely that the fracture was of some standing ante mortem.

In this connection it must be remembered that in the skull small portions of bone not infrequently ossify from irregular independent centres and remain for some time as small bones separable by maceration and disarticulation and known as ossa triquetra. The aperture left by the separation of one of these bones may be mistaken for a fracture produced by a weapon; the difference is usually well marked. If, on the one hand, the bone has not yet united with the others, the edges of the opening will be found quite thin and, as it were, bevelled off, and possibly membrane may be found on the edge. If, on the other hand, it has united, then the serrate suture or line of junction with the other bones can hardly be mistaken for the appearance of a fracture; it will be too regular without any splintering.

The following case of suspected child-murder occurred in 1847:—The dead body of a new-born child, wrapped in brown paper and a towel, was found in a pond. Lord examined it for the coroner's inquest. The head was much decomposed, and the scalp was extensively lacerated and destroyed over the parietal bones, which readily separated. The brain was reduced to a pulp. The umbilical cord, which had not been tied, was cut obliquely at about six inches from the navel. The lungs, which were very crepitant, readily floated on water, and bore up the heart. The body was generally bloodless. The point of difficulty which the case presented consisted in the presence of two apertures on one parietal bone. These apertures were small and rounded, and it was at first doubtful whether they had not been wilfully produced by some perforating instrument applied to the head. It was remarked that one aperture was situated near the temporal ridge, and in this situation the scalp was entire and uninjured. The other was situated in that part of the bone which corresponded to the lacerated portion of the scalp. It was ascertained that no violence had been used in the removal of the body from the water. The bone was macerated, and carefully examined by the aid of a lens. It was then perceived that the apertures were quite regular at the edges, which were remarkably thin, evidently passing into a membranous condition. The internal table was also deficient, so that, from the interior, the bone was bevelled off gradually from each aperture. This examination left no doubt that the holes in the bone were not due to any mechanical violence applied during life, but to deficient ossification. These spaces had been membranous, and the membrane destroyed by decomposition. The putrefaction of the scalp, and its separation, might have been accelerated by a bruised condition of these parts during a difficult labour. These natural defects are generally well characterised. They may be found at all ages. Turner has described and figured some of these cases (*Edin. Med. Jour.*, August, 1865, p. 133).

(11) Identification of Burnt Bodies.

The bones which we are required to examine may have undergone *calcination*. In several cases of child-murder which have occurred, an attempt has been made to dispose of the body by burning it. This method of disposing of a dead body is by no means unusual in cases of alleged infanticide and concealment of birth. There will be no great

difficulty in giving an opinion whether a bone has or has not undergone calcination. Its character is entirely altered. Its shape may be preserved, but if burnt in the open air, it will be white ; if in a close fire, it will be black or ash-grey. The bone is brittle, easily pulverisable, and dissolves in hydrochloric acid, leaving, if perfectly calcined, only some charcoal, but no animal matter.

In the case of *The Queen* v. *Varney* (Oxford Lent Ass., 1837), it was proved that the woman had been pregnant, and subsequently delivered of a child. Its body had been burnt, and only a few remains of the bones of a human fœtus were found in the ashes of a grate. The prisoner was convicted of concealment of birth. In a case like this, in which an attempt had been made to destroy the body of a child by burning, it will, of course, be necessary to have good evidence that the bones are those of a *human fœtus*, or child. A small fragment only of either end of any well-marked bone will suffice for identification. If the jaws be forthcoming, the alveolar cavities should be sought for, and the number and condition of the teeth noticed. The period of uterine life which the child had attained may be thus in some instances determined, as also by the presence or absence of certain ossificatory points in the bones.

If the body has been burned to a complete ash or powder, it will then be difficult to identify the bones. Orfila was consulted in a case of this kind, where a woman had burnt a child in an oven, and its ashes had become mixed with those of wood. He suggested that on calcining the residue with potash the ashes of a human fœtus might be known by their yielding cyanide of potassium, owing to the nitrogen which would remain in and about them. The ashes of wood do not yield the cyanide under similar circumstances ("Ann. d'Hyg.," 1845, 2, 129). The conclusions drawn under such circumstances might, however, lead to a serious error: the presence of a flannel dress, of an old hat, shoe, or any nitrogenous substance, would on incineration give rise to precisely similar results. When the *form* of a bone cannot be recognised, all that medical evidence can accomplish may be thus stated :—The detection of a large quantity of *phosphate of calcium* in the ash would indicate that bones were present, and thus distinguish the ash of bone from the ashes of other substances. Still the bones might have belonged to an animal, and not to a human fœtus. There are no means of distinguishing the ash of human from that of animal bone, or the ash of fœtal from the ash of adult bones. In the case of the Lemoines, mother and daughter, tried before the French courts in 1859, the evidence went to show that the elder prisoner (the mother) burnt the body of a child of which her daughter had been secretly delivered. Some bones of a child were recovered, and among others the frontal bone. The medical evidence was to the effect that the bones were those of a child which had reached about the seventh or eighth month. Upon this corroboration, the jury convicted the elder prisoner, and the court sentenced her to twenty years' imprisonment.

In a case of concealment of birth (*Reg.* v. *Berryman*, Guildford Sum. Ass., 1854), it was proved by medical evidence that the prisoner had been recently delivered of a child of not less than seven months' uterine age. She said that she had burnt the body to conceal her

shame, and had buried the remains in a garden. Some bones which had been calcined were there found buried in ashes, and after an examination of them a medical man stated that they were the bones of a child nine months of age; but in comparing them with the skulls of nine-months children in museum collections it was admitted that the skull of which the parts had been found and restored was larger. This admission threw some doubt on the identity of the bones, and the prisoner was discharged.

In 1863, a man named Barton, a fireman employed at a coal-pit near Wigan, was missing. From the appearance of blood about the mouth of the steam furnace and the discovery of a burned portion of the dress worn by the deceased, there was reason to believe that the man had been murdered and his body thrust into the furnace. Edwards examined the ashes of the furnace and found—(1) portions of the occipital bone of a skull; (2) base of the skull and two fangs of teeth,—a fang of an incisor and a fang of a molar tooth; (3) portions of the arches of the dorsal vertebræ; (4) a portion of the lumbar vertebræ; (5) a portion of the head, body, and joint of the humerus; and (6) a portion of the head and joint of the thigh-bone. These bones had been heated to a high temperature, which had destroyed their internal structure, but the external form was well preserved. They were all human bones. A chemical and microscopical examination of some of the clinkers showed that there was blood upon them, having the character of human blood. There was no doubt that these were the remains of the missing man. He was last seen alive at eight in the evening, and at four the following morning nothing remained of him but the few bones above mentioned.

Vide also the case of Dr. Parkman (p. 199).

In this discussion on identification of remains the following case, narrated by Dr. Taylor, is left in because of its intrinsic merits in showing the whole principles of the evidence in such inquiries:—

An English gentleman residing in India (1833) was charged with the murder of a native, Meer Khan. The evidence against the prisoner was of a twofold character: (1) that which preceded death and (2) that which followed it. With regard to the first, it will be only necessary to refer to it briefly. There was great discrepancy in the statements of the witnesses as to the manner in which the deceased was alleged to have been destroyed. It was shown that the deceased had received a beating at the hands of the accused, but it was not proved that the man had died in consequence of the beating. There was no effusion of blood; there were no marks of violence of any kind upon the body before or after death, unless, indeed, we except a burning of the skin of the legs, which was alleged to have been produced by burnt paper or straw, but the evidence respecting this was anything but coherent and conclusive. Be that as it may, however, there was no evidence to prove that the alleged burning was the cause of the man's death. Two of the men (natives) who said they carried the dead body to be buried at midnight testified to the presence of marks of burning, but contradicted each other respecting the appearance of the legs, one swearing that they were covered with plasters, the other that the wounds and burns were not covered. The latter witness prevaricated, and, when asked how he knew that the legs were burnt, replied that he judged so from their being *white*.

The testimony respecting the degree and effects of the violence applied to the deceased during life being so inconclusive, it was left to the jury to decide whether a quantity of human bones produced were those of the deceased, as it was alleged by the witnesses for the prosecution, or whether they belonged to the skeleton of some other person. According to the depositions, they were found in the following manner. *Three months* after the burial one of the witnesses who had assisted in

burying the deceased, after some search, discovered, as he supposed, the grave, on the verge of the bank of the river Damoodah. The body, it seems, had been buried pretty deeply in the sand, above the common water-mark, at the distance of sixty or eighty yards from the bed of the river, at a place which the waters had never reached, or could reach only on extraordinary occasions. The bones were uncovered, but not removed until five days afterwards. It does not seem to have been clearly made out whether other bodies were ever interred in that spot or not, nor was the grave properly identified as that of the deceased. The bones were subsequently examined by a medical officer, who stated in his evidence that twelve of the vertebræ, six of the ribs, and the sacrum were wanting; that the whole of the bones found were clean and dry, and were free from periosteum, ligaments, and cartilage; that *one rib was broken*, and apparently had an osseous callus (new bone) formed upon and around the fractured ends. The witness gave it as his opinion that the fracture must have occurred at least seven or eight days before death; he had never heard of an instance of exhumed bones being deprived of soft parts and ligaments by natural decomposition in three months. He should not expect the cartilages and ligaments to be separated from the bones within a year of the interment. He considered it, therefore, extremely improbable that these were the bones of the deceased, or of any person who had died within three months from the time of examination.

From this evidence several considerations suggest themselves, as, for example, the identity of all the bones as those of one individual; the age of the person; the nature of the bony excrescence or callus found on the broken rib; the time necessary for the formation of new bone in order to settle the period at which the fracture took place; the time required for the total spontaneous destruction of the muscles, tendons, ligaments, and viscera; also the time required for the spontaneous separation of the sacrum from the other bones in a man of the age of fifty or sixty. Many of these points, important as they were, were altogether passed over. The witness gave it as his opinion that they were the bones of a *male* subject; but of this, he said, he could not be quite certain, as the sacrum was wanting. No opinion was asked or given as to the supposed *age* of the person to whom the bones belonged. Only one bone was produced in court, viz. the broken rib, with the deposit of callus (new bone) at its extremity. From the state of this callus there could be no doubt, supposing the bone to have belonged to the deceased, that the *fracture* must have been produced about eight or ten days before death, therefore at some time previous to the violence employed by the prisoner. The non-identity of the bones as those of the deceased seems, however, to have been clearly established by the condition in which they were discovered. Even in a tropical climate the period that must elapse before the total destruction of the soft parts of the body in a grave, so that nothing but the bare bones shall remain, must be considerably greater than three months. In one instance, in which the body was exhumed four months after death, the soft parts were still present.

Another curious feature was the separation of the sacrum from the bones of the pelvis. The junction of these bones by ligaments and fibro-cartilage is perhaps one of the strongest in the body. In the skeletons of the young these bones are rather difficult of separation; but in the old, in whom anchylosis (or bony union) in general takes place to a greater or less extent, the difficulty of separating them becomes incomparably greater. It may readily be conceived, then, that the entire separation of this bone by decomposition would require, even in a hot climate, a very long period in a body interred in the ground, probably from three to ten years. Now, when we consider that the deceased had not been buried above three months, it is clear, both from the entire destruction of the soft parts and the separation of the sacrum, that the bones discovered on the bank of the river could not have belonged to the deceased, but must have been part of the skeleton of a person whose body had been buried in the spot many years before. There was, therefore, a complete failure of identity, and the accused was discharged.

EXHUMATION OF BODIES.

Identification of a body for medico-legal purposes receives one of its best illustrations in official exhumations. These are most frequently granted in cases in which suspicions of poisoning have arisen, and consequently many of the notes below will be found to refer to that

condition; exhumation is, however, occasionally granted for other purposes, so that the general principles of the exhumation of the body must be considered. The body of a deceased person when exhumed should be identified by some friend or relative, in the presence of the medical examiner. In one case of murder by poison, the evidence almost failed owing to this precaution not having been taken. In the case given below the judge seemed to regard this identification as unnecessary. But the order of the Secretary of State does not warrant the examination of any body except that of the person named in the order. And the finding of a human body in a coffin does not prove that it is the body named on the coffin-plate. The body of a male has more than once been found in a coffin bearing the plate of a female, and *vice versâ*. Again, coffins with name-plates have been exhumed and found to be empty! But it is necessary to insist upon still closer identification. The name of the deceased person whose body is sought may be a very common one, and bodies with similar names on the coffin-plates may be buried in the same plot or in the same grave. Hence it is of paramount importance that the exhumed body should not only be identified as that of A. B., but of the particular A. B. whose death is being inquired into.

The following is Dr. Lowndes' verbatim report on the case above mentioned. It furnishes an excellent illustration of how an exhumation should be done when possible, so that no doubt may exist as to whose body has been examined:—

Exhumation of Margaret Jennings, 295 *days after death*, 292 *after burial*.—On Friday, the 16th November, 1883, I attended at Ford cemetery, which is for the exclusive use of Roman Catholics. On my arrival I was met by Detective Inspector Boyes and the superintendent of the cemetery, who conducted me to the public portion of the cemetery. In a recently opened grave was a coffin which was supposed to be that of Margaret Jennings. The coffin-plate had just been removed; it was little changed, and bore the name "Margaret Jennings, died 25th January, 1883, aged 18."

The father of the deceased (Patrick Jennings) was present, also a woman named Agnes Wharton, and William Lukeman (foreman to Mr. Brumby, undertaker), who conducted the funeral of the deceased. The grave was made partly of sand, partly of clay, and the coffin, a pine deal one, remained intact. There was some effluvium, but the coffin appeared quite secure. Lukeman identified it as one of Mr. Brumby's make. In reply to my question, the deceased's father stated that he would be able to identify his daughter by her hair, which was dark brown; he also added that she had no false teeth, but good teeth of her own. The coffin was then raised and removed to the Prince's Dock Deadhouse, as the cemetery was not within the district of the coroner of Liverpool. Detective Musgrave accompanied the coffin, and Inspector Boyes went with me. On the arrival of the coffin at the deadhouse it was opened by Lukeman. A piece of muslin over the face adhered to it. The grave-clothes were entire, though much soiled. There was a good deal of effluvia at first. The body was that of a female of eighteen years or thereabouts, rather short in stature, with large dark brown hair. Patrick Jennings and Agnes Wharton distinctly and positively identified the body as that of Margaret Jennings. It was then removed from the coffin, well washed with cold water from a hose, and carefully examined. The surface showed decomposition. The eyes were gone; the cartilages of the nose had disappeared; the hair was loosening from the scalp and easily pulled out. I removed some of it, and delivered it to Detective Boyes. The mouth was open; the teeth were loosening; the skin was peeling off, and came away with the clothes on removing the latter. The nails on the fingers and toes were adherent to the parts beneath and perfect. There was a quantity of dark-coloured hair about the pubes.

On opening the chest I found a considerable amount of fat in its walls. The lungs and heart were much decomposed. On opening the abdomen I found a

good deal of fat in the mesentery as well as in the walls of the cavity itself. The stomach and duodenum were empty and much softened. The liver, spleen, kidneys, all the intestines and pelvic viscera, were fairly well preserved. In the presence of Detectives Boyes and Musgrave, I placed the stomach and all the intestines, portions of the liver, the spleen, left kidney, the urinary bladder, uterus, and appendages into five glass jars, specially bought and cleaned for the purpose, as follows:—

No. 1, containing stomach and duodenum.
No. 2, portions of liver, the spleen, left kidney.
No. 3, large intestines except rectum.
No. 4, small intestines (jejunum and ilium).
No. 5, urinary bladder, uterus, and rectum.

Each jar was secured with a close-fitting glass stopper, covered with skin leather, tied down with stout string, and two private seals were affixed to each. The seals were (1) my initials, "F. W. L.," and (2) a crest with motto. Each jar was labelled "Margaret Jennings," with separate numbers—1, 2, 3, 4, 5—affixed to each, with the date, Nov. 16th, 1883.

I opened the head, and found the brain to be in an almost liquid state from decomposition. The upper part of the spinal cord was easily seen through the foramen magnum; it was softening, though firmer than the brain.

I delivered the jars to Mr. Edward Davies, analytical chemist at the Royal Institution Laboratory, that same day, and subsequently I examined the various viscera at Mr. Davies' laboratory in his presence. The small intestines were empty, as was also the rectum. There was some fæcal matter in the colon, and patches of redness throughout the small intestine and rectum.

Mr. Davies found traces of arsenic in the liver, spleen, and kidney, also in the stomach and duodenum; no trace of it was found in the rectum, bladder, or uterus. Subsequently, in conjunction with Dr. Campbell Brown, Mr. Davies estimated that the whole quantity of arsenic present in the viscera was equivalent to a quarter of a grain.

We may call attention to the following points in the above report:—

1. The soil in which burial had taken place was noticed (*vide* "Decomposition").

2. The coffin was identified by its make and material as one commonly made by the particular undertaker who buried the body.

3. The name-plate was identified.

4. The body was identified by as many people as possible.

5. The stage of decomposition was noted.

6. The viscera were preserved in separate, clean, secured, and labelled bottles (*vide* "Poisoning").

It is important that the viscera taken from a body which has been long in the grave should be sealed up immediately. They should not be allowed to come in contact with any metal, nor with any surface except that of clean glass, porcelain, or wood. It has been recommended that they should be washed with chlorinated lime, or placed in alcohol; but this is decidedly improper: the use of any preservative chemical liquid would not only embarrass the future analysis, but would render a special examination of an unused portion of the liquid necessary, the identity of which would have to be unequivocally established. Preservation from air in clean glass vessels, with well-fitted corks, covered with skin or, what is still better, sheet caoutchouc or gutta-percha, is all that is required in practice.

It has been recommended that a portion of earth immediately above and below the coffin should be removed for analysis, as it may contain arsenic; but this appears to be an unnecessary piece of refinement when the coffin is entire or when the abdominal parietes still cover

the viscera. If decomposition has so far advanced as to have led to an admixture of earth with the viscera, and the poison is found in minute quantity in the tissues only, the source of the poison may be regarded as doubtful.

So long as the coffin remains entire there may be some expectation of discovering poison by analysis, but decomposition may have proceeded so far as to destroy all gross pathological evidence either of poison or of wounds, marks of strangulation, etc., but it may be laid down as an axiom that it is never too late to attempt an autopsy, for evidence may be found of quite an unexpected nature, possibly throwing considerable light on an otherwise obscure case. Thus scars, tattoos, hair, the teeth, and in fact any of the points of identification may still be visible on careful inspection, and may lead to a correct identification of a body that may have been buried under a wrong name, and upon which correct identification most important issues may depend, whether these be of a civil or criminal nature. More than one man has been buried to reappear after a lapse of many years. A case of this nature excited a nine days' wonder in 1904, but as there were no particular monetary interests at stake, and no suggestion of fraud, but little notice was taken of it.

SECTION V.

PREMATURE BURIAL.

TOGETHER WITH THE SIGNS OF DEATH AND THE CHANGES THAT TAKE PLACE IN THE BODY SUBSEQUENT TO DEATH AND INFERENCES TO BE DRAWN FROM A DEAD BODY.

With regard to the latter half of this part of our subject most important questions of a medico-legal nature are constantly arising; with regard to the former, which means the reality of death, it is but seldom that any question can arise, and were it not for the fear entertained by the public that live-burial occasionally does take place, and for a doubt as to how long efforts at restoring animation should be persevered with in cases of apparent death, such as drowning, hanging, and in new-born children, etc., the matter might be passed over almost in silence.

PREMATURE BURIAL.

There is something terrible in admitting the bare possibility of such an event; and therefore we ought not to reject the supposition without examining the numerous cases which have been brought forward in support of it. In the work of Fontenelle *forty-six* cases are recorded either of the premature interment of the living, or of apparent being mistaken for real death. From a careful examination of all these cases, it appears that the greater number of them are derived from such sources as to render them perfectly inadmissible as evidence of what Fontenelle so strenuously endeavoured to prove. He has collected these cases from every source, whether scientific or not, from the time of Plutarch downwards. This very circumstance would make reasonable men distrust those instances of supposed death which are undoubtedly authentic did not the facts appear explicable on the most common physiological principles.

The fears which works like that of Fontenelle are likely to excite respecting premature interment have been kept up by other French writers. A petition was, on one occasion, presented to the French Chamber of Deputies in which the petitioner declared that he had known six interments of living persons to have taken place within a period of eight months. Resting on similar authority, Carré asserted that since 1833 there have been forty-six cases of premature burial. Among these twenty-one persons returned to life at the time they were about to be deposited in the earth, nine recovered owing to the

affectionate attentions of their relatives, four from the accidental falling of the coffins, two from a feeling of suffocation in their coffins, three from the punctures of pins in fastening the shrouds, and seven from unusual delay in the funerals; and it is added, after this marvellous recital, that the decease of all these individuals was officially attested. A statistical calculation was then made by him from the deaths which occur annually in Paris of the average number of persons who were likely to be buried alive.

The evening papers in London are the great offenders in this respect of trying to get up a sensation by means of their placards: "Girl Buried Alive," etc. The evil of such a tale lives long after the denial of its truth.

We have no need, however, to go back to ancient history to prove that without care on the part of a medical man persons might be "consigned to a living tomb." The following extracts from the *Lancet*, vol. 1 for 1900, pp. 582 and 661, show that any rate in warmer climates than England the idea can have a possible foundation in fact:—

"*Apparent Death and Premature Burial.*

"Shortly after the great cholera visitation of 1866 Dr. Filippo Pacini, professor of anatomy in Florence (who gave his name to the 'corpuscula nervosa'), called attention to this subject in a memorable paper. He cited not a few cases in which the patient, certified as dead, had come to life on his way to the cemetery, and he started the not unnatural, if horrible, inference that the resuscitation referred to may in several instances have come about within the grave itself. The rapidity, not to say the haste, with which burial follows death in Italy gave colour to the gruesome surmise. Indeed, the next great cholera epidemic, that of 1884, afforded something very like a case in point.

"At Turin a well-known physician who had lived through the epidemic was at last seized with the malady, and, worn out by professional duty, failed to rally. Certified as dead, he was laid out for the offices of the undertaker in a room adjoining that in which his wife and family were awaiting his consignment to the coffin. To their horror and amazement, he appeared at the door in his winding-sheet, and, in a voice barely audible, reproached them for having left him so long uncared for. Every effort was immediately made to ensure his rescue, but in vain. He relapsed, and death, real this time, not "apparent," supervened. Had the undertaker arrived twenty minutes sooner, the unfortunate man would have revived under the coffin lid.

"The incident made a profound impression at the time, and restarted, while redoubling, the apprehensions aroused by Pacini. Now we are having another such recrudescence of these, the heavy mortality due to influenza and the all too brief interval between the issue of the death certificate and the interment or cremation of the victim sufficing to reawake them. Unfortunately for the peace of mind of the public, a highly sensational, but quite authentic, case of the kind—not, however, occurring after influenza—is reported from Southern Italy.

"At Lecce, a young countrywoman, as the result of a very difficult confinement necessitating much unavoidable intervention, appeared to have died, her offspring, also given up for dead, remaining in utero. In accordance with Italian custom, the funeral was fixed for the next day, and the body was left in its coffin

in the mortuary chapel adjoining the cemetery. Early in the morning, some hours before the burial, a photographer who was commissioned to take the poor woman's likeness obtained leave from the *custode* of the chapel to open the coffin. Hardly was this done when the two men were shocked to find that the corpse, which had been placed on its back, was now on its side, and close to it was a lovely child wanting both arms, which had been detached during the obstetric operations. The judicial authorities, including the *giudice istruttore*, were at once called in, and found that the woman had come out of the lethargic condition in which she had appeared as dead and had given birth to her child in the coffin, *dopo atroce agonia*, says their report, resulting in the suffocation of both.

"It seems from evidence extracted from the *custode* that during the night while a storm was raging he had heard feeble cries as of some one calling for help in the mortuary chapel. The tragedy—for such it is—has evoked much comment, pending the official inquiry now in progress."

"The tragic 'case in point' reported in the *Lancet* of February 24th from Lecce (Apulia) has thrilled the kingdom with horror 'from the Alps to Etna'—horror shared by the foreign resident, who may, as the result of illness, be equally the victim of Italian usage, which makes burial follow so closely on death, real or apparent. Popular interest in the theme is now accentuated by indignation, combined with panic, and increased vigilance over the circumstances intervening between the death certificate and the offices of the undertaker is leading to the discovery of cases only less gruesome than that of the Apulian peasant woman. The latest of these comes from no less a quarter than the Ligurian Riviera, that lovely stretch of coast indented with sun-traps of which Genoa and Spezia are the chief towns. In the village of Roccabruna, near Porto Maurizio, an old countryman, Raffaele Rainoldi by name, fell ill, failed to recover, was certified as dead, and was laid in the coffin, with the despatch characteristic of Italian use and wont on such occasions. The lid over him was actually being screwed down when he was felt to move and then heard to speak. Medical aid was at once invoked by the family, half beside itself with mingled joy, surprise, and horror; and, thanks to restoratives skilfully applied, the old man came round, recovered full consciousness, and inspired hopes of his recovery. These, however, were not realised. He lingered for two days and then died, death being this time not 'apparent,' but real. Coincident with the chronicling of these cases the lay press is opening its columns to the discussion of the familiar devices—some of which are actually in force in mortuary chapels on both sides of the Alps—by which the individual laid out as dead and even enclosed in the coffin can still have air to breathe and the power to attract notice and assistance. But none of these methods are of other than doubtful efficacy, the apparatus, for one thing, being too delicate and complicated not to get easily unworkable. A better 'device' would be the insistence on a reasonable interval, such as prevails in England, between the death certificate and burial or cremation, and also on a more careful and less haphazard examination of the 'dead' before certifying him as such.

"To such an extent has this fear of premature burial been carried in America that an association, called the American Society for the Prevention of Premature Burial, was actually started. (*Vide Lancet*, 2, 1900, p. 782.)

"Cases have undoubtedly presented themselves in which persons labouring under concussion, syncope, catalepsy, hysteria, or lifelessness from exhaustion, have been pronounced dead by bystanders merely because there happened to be inanimation, coldness of the surface, and no outward signs of respiration or circulation. If the decision of the question of life or death was always left to such persons, and interments were to follow in a few hours upon their dictation, there is no doubt living bodies would be exposed to the risk of premature burial. But this can rarely happen in any civilised country of Europe, and then only as the result of gross and culpable neglect.

"The following is a brief report of a case that was discussed at the Bradford Med. Chir. Soc. (*vide Lancet*, February 17th, 1900, p. 464):—

"Dr. H. C. Major related a case of trance which had a fatal termination. The patient was a woman, aged fifty years, and was seen in consultation with Dr. G. H. Moorhead. She lay almost as one dead; there was intense pallor of the skin, and the muscles were relaxed. The respirations were exceedingly shallow, and the heart's impulse was very weak. The conjunctival and other reflexes were absent, and she could not be roused to show any evidence of consciousness. The onset had been rather sudden three days previously; there were at first some transient spasmodic movements of the limbs. She continued in this state for about three weeks, and finally died from exhaustion. She had been fed artificially by enemata and by the nasal tube. Physical examination was negative. The optic discs were normal. Post-mortem examination revealed nothing except anæmia of the nervous system and organs generally. The case was diagnosed as one of death trance—a very rare affection. The symptoms appeared to depend on profound functional inhibition of the nerve-centres.

"As regards diagnosis, uræmia, diabetic coma, cerebral tumour, and hæmorrhage must be eliminated, but a case of trance declared itself in a short time. Practical considerations in the treatment of such a case were—examination of urine for albumen and sugar to exclude uræmic and diabetic coma, regular nasal feeding, the administration of amyl nitrite, and the injection of normal saline either into cellular tissue or the rectum. Faradaisation of the surface of the dry skin with electric brush was worthy of trial. Should death appear to take place, they must be exceedingly careful before allowing any one to act on that supposition. It was an acknowledged fact that patients had almost been put into their coffins while in a condition of trance. The faradaic current should be applied to the muscles. Muscular contractions ceased three hours after death (care must be taken to see that the current employed would cause contractions of normal muscles). A case was recorded by Rosenthal in which, thirty-three hours after apparent death, the muscles continued to react to faradaism; and forty-four hours after the patient awaked. Dr. H. J. Campbell mentioned a case in which the patient had twice been put into her coffin and subsequently recovered."

Cases of prolonged and profound sleep of a natural kind, which have also been described as cases of trance, cannot be mistaken for death. Cousins met with an instance which may be taken as the type of others. A man of healthy habits, forty-three years of age, was at intervals subject to attacks of long and persistent

sleep. He would retire to bed at his usual hour, and, without any warning symptoms, suddenly and almost immediately fall into a profound sleep, from which all the usual means would fail to arouse him. In this state, his face and ears were pale; the skin was pale and generally warm, but his feet were cold and livid, and the limbs quite relaxed. His pulse was soft, slow, and feeble, his respirations almost imperceptible, amounting to about eight or nine in a minute. He appeared like a person in a refreshing, tranquil slumber. There was no stertor or snoring. The longest period he ever passed in profound sleep was five days and five nights. He frequently slept three days and occasionally four days without waking, but his average period was two days. His secretions were suppressed, and no food was required. He commonly awoke suddenly, and had no consciousness of the lapse of time, and retained a good remembrance of the last occurrences before he fell into this state. He had no dreams (*Med. Times and Gaz.*, 1863, 1, p. 396).

Non-professional persons may readily mistake a state of insensibility for death, and in acting upon this belief may lead to the death of a living person. Guthrie mentions the case of a man labouring under concussion while on board a vessel:—

> He was supposed by his brother and the captain to be dead or dying, and, without being able to make any movement to indicate that he was alive and understood their conversation, he heard them discussing the question whether his body should be buried at sea or carried on to Rotterdam. Fortunately the latter alternative was adopted. Druitt reports two cases of a somewhat similar kind. A gentleman who was most severely affected with cholera in India told him that when the disease had gained the complete mastery over him he lay utterly deprived of speech and motion, whilst he could distinctly hear his attendants, who conceived him to be insensible, speculate on the time of his decease, which they judged to be very near at hand. He then, besides being speechless, became blind and deaf; but although thus cut off from all communication with the external world and, in common language, insensible, he still retained his consciousness and self-possession, and reflected on his apparently inevitable death. Afterwards he lost all thought and consciousness, and remained thus on the very threshold of death for some hours, and then recovered. The other case was that of a boy, æt. 6. He had small-pox, was pronounced dead, and his body was put into a coffin. After some hours, he became conscious, heard the voice of his mother, who sat by the coffin, and he essayed to speak; but, as he afterwards said, he was unable to make any movement or sound to show that he was alive. At last, however, his mother's attention was drawn to some apparent change in the features; she watched him narrowly, perceived the lips to quiver, and soon he was able faintly to articulate a wish for wine (*Edin. Month. Jour.*, April, 1844, p. 355).

The historical case of Colonel Townshend, who could, by a simple effort of the will, so diminish the power of his heart's action that no radial pulse could be felt, and the case mentioned in Foster's "Physiology" of a person who could bring about the same result by pressure on a small tumour in the neck, may be mentioned in the same connection, though they were not cases that in actual fact gave rise to any difficulty.

Reality of Death in Recent Drowning or Hanging.—It may be occasionally difficult to form an opinion of the reality of death in cases of recent drowning or hanging. Coldness and stiffness of the body in the drowned should not prevent the application of means for the restoration of life. One or two hours may elapse before signs of

animation appear, and in one instance a drowned person was not restored until the means of resuscitation had been applied for eight hours and a half. There is reason to believe that some persons removed from water in a state of apparent death are consigned to actual death owing to want of timely application of the means, and a want of perseverance in the treatment. The continued coldness of the body and the absence of any evidences of success after a few trials are commonly taken as sure signs that the person is really dead. There appears, however, to be in some cases a lingering vitality about the body. In an attempt to resuscitate a drowned person who had been five minutes below the water, and was speedily treated after removal, it was observed that the face, which had been pale, became suddenly livid, and underwent a remarkable change of expression. This appearance, however, was only momentary; continued efforts failed to restore life. In this form of asphyxia, as well as in hanging and suffocation, some caution is required in pronouncing that a person is really dead, since it at once discourages the efforts of those who are employing means for resuscitation. If the body has been for half an hour or longer under water, if it has been found hanging or in a suffocating medium and is cold and rigid, there can be no hope of resuscitation.

Apparent Death in New-born Children.—In new-born children it is sometimes difficult to say whether life has or has not ceased. Brachet has succeeded in restoring children in whom the heart's action had been suspended from fifteen to twenty minutes. Respiration and circulation are carried on in such a tranquil manner in an apparently lifeless body that, except by the presence of some degree of warmth and the absence of rigidity, the child might be pronounced dead. Cases are elsewhere recorded in which children have survived birth for six, and even for twenty-four hours, in this state of passive life. After death no air was found in the lungs. (See "Infanticide.")

The Remedy for the Prevention of such Catastrophes and Mistakes.

The remedy for an evil of this kind is not to discover some certain sign of death to guide ignorant persons—for it would be always dangerous to give them a power of judging—but to enforce strictly the following:—

1. That no body shall be buried within twenty-four hours of death.

2. To amend the law regarding the registration of deaths and births so that (*a*) no body shall be buried without a certificate signed by a qualified registered medical man or a coroner; (*b*) such certificate shall only be given by these gentlemen after *proof* of the death of the person so certified to be dead.

Interment not to take place within Twenty-four Hours of Death.—Mortuaries are useful in poor districts for the reception of bodies after verification of death until interment can take place, but not on the ground that there are no means of determining the reality of death before putrefaction has taken place. Mistakes of this kind are not

likely to be made by medical men. In order to avoid the possibility of such occurrences, no interment should be allowed to take place until after the lapse of twenty-four hours, at the least, from the time of the supposed death, and not even then except upon the certificate of a medical practitioner who has examined the body. No mischief is likely to result to the living by the adoption of such a practice; while it would effectually guard against premature interment among the lower classes of society. In assigning twenty-four hours, this is to be taken as an average period; there are cases in which the most striking phenomena of death, such as coldness and rigidity, may manifest themselves within a much shorter time than this, and in such cases a medical opinion may be given without any difficulty. No coroner's inquest should be held upon a body until twenty-four hours after death. In one instance an inquest was held on a body half an hour only after the apparent cessation of life. At present the *cause* of death is certified, and a body cannot be buried except upon the certificate of the registrar; but the medical attendant has it in his power to give the certificate without seeing or examining the body of the deceased at that period after death which is necessary for the clear development of the signs of dissolution. Hence, unless, as it commonly happens, the interment be delayed by the relatives for twenty-four hours at the least, there might be a risk of prematurely consigning a living person to the grave.

During the prevalence of epidemic disease, as in cholera times, a provision was made that interments should not be delayed beyond twenty-four hours when death had taken place from the disease. There is no doubt that many bodies were interred during the raging of the epidemic within eight or ten hours after apparent death. One instance was communicated to the author where the body was wrapped in a pitched cloth and buried within *six hours* after the signs of life had ceased. This is assuredly a most condemnable practice, especially in cases in which the deceased has not been attended by a medical practitioner. In France the law ordains that every death must be verified by a medical officer, and that no interment shall take place until after the lapse of twenty-four hours from the time of death. This rule, it is said, applies only to Paris and some of the chief cities of France. No post-mortem examination should be made, and no interment take place, until after a certificate of death has been issued by the proper medical officer. A similar law prevails in Naples and in Portugal; but Fontenelle states that in the latter country, as well as in Spain, bodies are sometimes interred within *five* or *six* hours after death. In the Protestant parts of Germany and Switzerland the dead are rarely buried until after the lapse of three days, a period being fixed by law before which interment cannot take place. In this country there are no legal provisions relative to the period of interment; but, except under severe and continuous epidemics, the dead are rarely buried until after the lapse of from one to five days. It would, no doubt, be a good regulation if every dead body were seen and examined by a medical man twenty-four hours after apparent death, and the fact of death were officially attested by him according to circumstances. The defect of the Continental system is that a medical opinion may be given at any time after the supposed decease, and there may be

occasionally great negligence in the performance of this duty. Still it is impossible to admit that, except under the most culpable neglect, persons can incur the risk of being buried alive when the body has been kept at least twenty-four hours from the time of the supposed decease. It is stated, on the authority of Salignac-Fénélon, that in a period of twenty years, during which mortuary houses have been established in Germany, no body has ever been restored to life, although during that time no fewer than 46,000 bodies have been deposited therein ("Ann. d'Hyg.," 1870, 2, 317).

If we allow a proper interval to elapse after the supposed death, there can be no difficulty in solving the question whether a person is really dead even before any of those changes, which arise from putrefaction, have manifested themselves. The circumstances on which we may rely as furnishing conclusive evidence of death are the following :—(1) the absence of circulation and respiration for at least *an hour*, the stethoscope being always employed; (2) the gradual cooling of the body, the trunk remaining warm while the members are cold; and (3) as the body cools the gradual supervention of a rigid state of the muscles, successively attacking the limbs and trunk, and ultimately spreading through the whole muscular system.

When these conditions are observed, the proof of death is conclusive; it is unnecessary to wait for any sign of putrefaction. These changes are as certainly the forerunners of putrefaction as the process of putrefaction is itself the forerunner of the entire destruction of the body. It may be safely said that there has not been a single instance of resuscitation after rigidity had once commenced in a body. During the raging of epidemics, if additional evidence be required for early burial, it might be obtained by exposing a superficial muscle to the electric stimulus. If the fibres do not contract, death is certain. If they do, this is no proof that the person can be restored to active life; but further time may be allowed before the body is committed to the grave.

Reform in the Law regarding the Registration of Deaths and Births.—While then it is practically certain that delay of twenty-four hours would remedy the scandal of the possibility of premature burial, there is another aspect of death certification which may well be noticed here, viz., that an alteration in the registration mechanism would probably result in the avoidance of many other scandals, such as secret poisonings, false certificates for insurance purposes, etc.

In the *Lancet*, vol. 2, 1899, pp. 1541 and 1610, will be found two very excellent articles dealing with this subject. It is here stated that "more than six years have passed since the Select Committee of the House of Commons appointed to inquire into the subject of death certification issued their report." (*Vide* paper by F. W. Lowndes on "Death Certification and the Recommendations of the Committee of the House of Commons," *Liverpool Med. Chir. Jour.*, July, 1893.) "None of the Committee's recommendations have been adopted, and things remain as they were." The editor has reason to believe that this is still true in 1904, with a result that Mrs. Chapman and others have met their deaths, and only special acumen on the part of medical men led to the discovery of foul play. The British Medical Association

has the matter in hand, but the necessity for speedy alteration is as urgent as ever; but presumably some greater scandals are required to stir the conscience and activity of Parliament.

For instructive leader on the need for reform in the registration of births and deaths, *vide Lancet*, 2, 1903, p. 1736. The arguments are based on (1) statistics of facts of unregistered deaths; (2) on the facilities for crime offered by accepting certificates from unregistered persons; (3) on the inaccuracy in collected returns which must result from such slipshod methods of registration.

The chief abuse in our present system is the systematic acceptance by some registrars of statements by unqualified practitioners as to the cause of death, which are accepted technically as "information," but virtually as death certificates. So long as this practice obtains so long will quackery (*q.v.*) exist in its most dangerous form, unrestrained by any fear of a prosecution for manslaughter or worse.

In 1903 the *Lancet*, vol. 2, p. 1798, says:

"In more than one instance attention was called to the danger of fraud being promoted and assisted by medical men giving death certificates without actual knowledge of the fact of death. It is not necessary that a medical man should see the dead body of his patient before certifying, but he is empowered by the form of certificate issued to him to qualify his statement that death has taken place by the words 'as I am informed.' An illustration of the results which might (one can say must necessarily) arise when certificates are given without seeing the body will be found in *B. M. J.*, 2, 1903, p. 605. Where by a mistake or by an intentional misstatement a medical practitioner is induced to believe that a patient, likely to die, is dead, a death certificate given by him may be used for the purpose of defrauding a life assurance office." (*Vide* "Insurance.")

The editor cannot leave this subject without expressing in the most emphatic terms his own belief that there is no case on record in England of premature burial that will stand examination, and further that even as our death certification laws stand at present there is not the slightest chance of such an occurrence. Dr. Lowndes, of Liverpool, has written very strongly in the same sense, and states that, after extensive inquiries from men whom he knows intimately, he is absolutely unable to get any hint of a possibility of premature burial.

Alteration in the law is required very much more for the purpose of preventing fraud than for any idea of preventing premature burial.

This statement is fully confirmed by investigations in France (see "Ann. d'Hyg.," 1867, 1, 293). The results depend on the care taken in the attestation of death by the appointed medical officers. The same care given to every case of alleged death would, of course, be attended with similar results, whether the dead body is placed in a mortuary or not. When a death has not been properly attested by a medical man, a mistake may be made. Devergie distinctly showed that the alleged premature burials, on which he was requested to report, could not possibly have taken place except through gross neglect of the law.

SIGNS OF DEATH.

These will be discussed in the following order :—

1. Cessation of circulation.
2. Cessation of respiration.
3. Cooling of the body.
4. Insensibility and loss of power to move.
5. Changes in the skin.
6. Action of heat upon the skin.
7. Changes in and about the eye.
8. Changes connected with the blood.
 (*a*) Coagulation.
 (*b*) Post-mortem bleeding.
 (*c*) Post-mortem hypostases.
9. Changes in muscles.
 (*a*) Period of irritability.
 (*b*) Rigor mortis.
 (*c*) Instantaneous rigidity.
10. Putrefaction and its processes.
11. Formation of adipocere.
12. Mummification.
13. Inferences to be drawn from a dead body.

1. Cessation of Circulation.

The cessation of this important function is often regarded as in itself sufficient to determine the reality of death, and rightly so if the observation be made with sufficient accuracy by the stethoscope and over a sufficiently prolonged period, say, half an hour for certain. Colonel Townshend, whose case has been mentioned above, was able to throw himself into a condition of pulselessness for nearly half an hour, but, as the stethoscope had not then been invented, it seems very highly probable that that instrument would, if continuously applied even for five minutes, have revealed some cardiac sounds, even if feeble and infrequent.[1] Ogston has given details of other well-authenticated cases of apparent voluntary death similar to that of Colonel Townshend ("Lect. on Med. Jur.," pp. 364, 368).

That the heart may beat even with undiminished vigour up to the last beat the present editor (F. J. S.) is convinced by what he believes to be an almost unique experience. He was engaged in counting the heart-beats of a pneumonic patient, and had counted some ten or eleven sounds, and was thinking how good and satisfactory they were, but no twelfth sound was heard. The patient had actually died at the moment of listening. *Per contra* he has also listened as the sounds grew feebler and less frequent, while the patient fainted and fell back on the bed apparently lifeless, but he then had the pleasure of hearing them return in a few seconds as the faintness passed away. Life is therefore not incompatible with a temporary suspension of heart-beat, but it is undeniable that the function must be speedily re-established, or death is certain.

To suppose that the important function of circulation can be wholly

[1] He really died some nine hours after the performance of the experiment, and nothing pathological was found on a post-mortem examination.

suspended for even an hour in a human being without destroying life is to set at defiance all physiological experience. Admitting the possibility of such a case occurring, it would require the best and most unequivocal evidence to support it. The phenomena of hybernation in many animals can have no reference to this condition, for in these a purpose is answered by the feeble state of existence into which they are thrown. While it is natural for such animals to remain torpid during the winter season, or to exist under a feeble exercise of the functions of respiration and circulation, it would be an unnatural condition for a human being, and inconsistent with the maintenance of life. The auscultatory test, applied at intervals during half an hour, cannot fail to lead to a satisfactory conclusion.

In awarding the Manni prize, founded for the discovery of a certain sign of death, the French commissioners, Dunéril, Andral, Magendie, Serres, and Rayer, very properly dwelt upon the state of the heart as furnishing the most unequivocal proof of death before the occurrence of cadaveric rigidity and putrefaction. Bouchut, to whom the prize was awarded in 1846, found, in an extensive series of researches experimentally confirmed by the commissioners themselves, that in all cases of apparent death, whether arising from asphyxia or syncope, there is one common character by which they may be distinguished from real death, and that is a continuance of the pulsations of the heart. He established the fact that in the most perfect state of syncope, attended with entire loss of motion and sensation, as well as cooling of the body, the contractions of the heart were not really at any time suspended, but simply reduced in force and frequency. In syncope from hæmorrhage carried to the fullest extent, and in cases in which respiration was either imperceptible or carried on at long intervals, the body at the same time having the aspect of a corpse, he was enabled by auscultation to detect the pulsations of the heart, and thus to distinguish apparent from real death. In children born in a state of apparent death and in cases of asphyxia from any cause, in narcotic poisoning, in hysterical and epileptic coma, and in all diseases which have been stated to resemble apparent death, the living has been easily distinguished from the dead body by the continuance of the heart's action. This was feeble, and took place at intervals, but it was always sufficiently marked to enable a professional man to distinguish a living from a dead body.

It was considered important, if possible, to define the periods at which, after the entire cessation of the heart's action, a person might be pronounced dead. Assuming that the last audible expiration has been made, that the motions of the chest have apparently ceased, and that no pulsation can be felt in any of the arteries of the neck or limbs, the longest interval that elapsed between the pulsations of the heart was about six seconds. Rayer, one of the commissioners, from his own observations on the dying, assigned as a maximum an interval of seven seconds between the last pulsations of this organ. If, therefore, no motion of the heart is perceived during an interval of *five minutes*, a period which is fifty times as great as that which observation warrants, death may be regarded as certain. With the cessation of the pulsations of the heart, the usual cardiac sounds also cease. At the same time their cessation furnishes a proof that respiration has

ceased, and that the functions of the nervous system are not merely suspended, but destroyed ("Ann. d'Hyg.," 1848, 2, 78).

This test has been objected to by Dowler (1) because the heart itself may, like other muscles, be in a state of apparent, and not real, death; and (2) because the pulsations and sounds of this organ may not always be appreciable to the ear, even when aided by the stethoscope. In support of these objections, it is stated that Brachet has repeatedly restored the vitality of new-born children in whom no pulsation whatever could be discovered for a period of fifteen to thirty minutes after birth. In one instance a child was revived, after *twenty minutes* of apparent death, by insufflation of the lungs, although during that time no pulsation could be heard or felt. Another case was that of a man, æt. thirty-three, whose heart presented no contraction that could be detected during at least eight minutes, although the ear was applied again and again. *Twenty minutes* after the suspension of its action a slight contraction was perceived in the heart, its pulsations then became regular, and the patient opened his eyes (*Philadel. Med. Exam.*, October, 1850, p. 599). To these may be added the case of Colonel Townshend, which carries the supposed period of the entire suspension of the heart's action to half an hour. Such cases however do not show that a person can live while the heart's action is thus continuously suspended, but that the means employed for testing the state of this organ have been insufficient.

If, however, the medical man is not satisfied with the test, there are two others which he may apply. One is to tie a piece of string or other ligature round a finger moderately tightly, and notice if, in the course of a few minutes, the finger swells on the distal side of the ligature. If no swelling whatever takes place, it is an additional proof that circulation has ceased, while if the end does swell it is a proof that circulation is still going on, though possibly only feebly, as by emptying of the arteries after the heart has ceased to beat. The second additional test should only be resorted to in extreme cases, as it involves opening a small artery. When this is opened the character of the blood flow must be noted. It will be jerky if the heart is still beating, continuous, like the flow from a vein, if the heart has ceased, and the bleeding is merely from the elastic contraction of the artery; if no flow whatever is obtained, death is certain under the special circumstances of the experiment.

2. Cessation of Respiration.

This, like the cessation of the heart-beat, must be *entire and continuous* to constitute any approximation to a test of the reality of death. There is every reason to believe that if the heart absolutely ceases to beat for a longer period than something under a minute death is certain, and the same is true of the act of respiration if a somewhat longer period of inactivity be allowed. It may cease for a very short period without death ensuing under the following two conditions, neither of which is likely however to give rise to any difficulty in connection with real or apparent death:—(*a*) As a purely voluntary act. Two minutes seems here to be the outside limit, which experience shows cannot be exceeded; even expert sponge-divers, who have spent their lives at the occupation, cannot remain under water without

artificial contrivances for a longer time than two minutes. (*b*) In the peculiar condition of respiration known as Cheyne-Stokes breathing the limit of the apnœic interval has never been known to exceed some fifteen to twenty seconds. In (*c*) the apparently drowned and (*d*) new-born infants the act of respiration, as performed by the mechanism of the body itself, is frequently absent for long periods, and doubts often occur as to whether life really remains in the body. It is quite possible that in some of both classes apparent passes into real death owing to a want of perseverance in artificial aids to establish natural breathing, but the subject is more fully discussed elsewhere (p. 237 and section on "Drowning"). It has not very much bearing on the reality of death in such cases as are here under discussion, in which it may be laid down that three and a half minutes is the extreme limit during which respiration may cease and yet life be maintained.

Tests for the Continuance of Breathing.—(1) The movements of respiration can hardly be overlooked by any person who exercises due care, but for the purpose it is necessary to have both the chest and the abdomen exposed to view. (2) The stethoscope must be carefully and continuously applied to the upper part of the lungs in front or to the larynx itself, by which means very slight currents of air may be detected. This test alone is practically sufficient, but if doubt still remains (3) a feather may be held in front of the mouth, when even the slightest breath will move some of the smallest divisions of it, or (4) a piece of cold bright-looking glass may be held there, the surface of which will be dimmed by the moisture deposited upon it from the breath if even the slightest respiration is continuing. (5) A glass of mercury or other bright reflecting surface may be placed on the chest, and the reflection of a light from it be focussed on a fixed spot. This image will be seen to move if respiratory movements of the slightest degree are still continuing.

3. Cooling of the Body.

One of the most striking characteristics of life is the power which the body of warm-blooded animals has of retaining a temperature far above that of the medium in which it is ordinarily placed. Notwithstanding that the body is constantly subjected to the same laws of cooling as all other heated solids, *i.e.* by radiation, conduction, and convection, the supply of heat internally is so constant and well regulated as to counterbalance exactly the loss which is experienced. When, therefore, life is extinguished, the body will gradually lose the heat which it possessed at the moment of death, just like so much inert organic matter artificially raised to the same temperature. The normal temperature of the interior of the body in health is about 98·4° F. Of all the changes that occur in the dead body that of cooling down to the temperature of its surroundings is the one about which we have the most knowledge. Its rate, with very few exceptions, obeys laws which are comparatively well understood, and it is perhaps the most reliable change by which to calculate the time that has elapsed since death.

In order to understand the process it is first necessary to give a brief outline of the sources of heat in the living body, the usual modes of loss, and the mechanisms by which the two work in harmony to

maintain during life a constant mean temperature in the human body. We can then more easily appreciate the rules and exceptions which experience and observation have afforded us.

(i.) *Sources of Heat.*—There is only one ultimate source of all the heat in the body, and that is the chemical process—probably always one of oxidation—by which complex bodies are reduced to ones of simpler construction. The places where this process goes on are as numerous as all the organs and tissues of the body, but physiologists have determined that the principal ones are the muscles in action, and the glands, in which the energy set free is largely converted into heat. By means of the blood circulation the heat produced in any one part is conveyed to other parts.

(ii.) *Loss of Heat.*—The main channels by which heat is lost to the body are conduction and radiation from the skin, warming the expired air and keeping the water of it vaporised, warming the excreta (urine and fæces), and to some extent by the converse process to oxidation, *i.e.* by building up new complex bodies out of simpler ones.

(iii.) *Regulation of Income and Expenditure.*—This is almost entirely brought about by vascular arrangements which in turn are controlled by the nervous system, the whole mechanism being so adapted to the needs of the body that when the muscles, etc., at any time or place are producing an excess of heat the blood carries this excess either to the skin or lungs, where it can be disposed of, or to other organs that require more heat than they are producing.

(iv.) *Cellular* v. *Somatic Death.*—In addition to the above three points, attention must be called to this fourth one. When a muscle or gland has by virtue of the circulation of nutritive materials in the blood become, so to speak, fully charged with the substances it needs for its own local life and the discharge of its own functions, it can continue to live and discharge certain of those functions—so far at least as the process of oxidation is concerned—without the usual nerve and other stimuli under which it is accustomed to act. This may be spoken of as cellular life (with its converse, or cellular death), which may and does continue for some little time after somatic death, or death in the ordinary sense of the word, has occurred.

(v.) *Co-efficient of Differences.*—This is a well-known mathematical, or rather physical, law, the meaning of which is this :—When two substances at different temperatures are brought into such relationship that either can give or receive heat, to or from the other, then the greater the initial difference between their temperatures the more rapidly will the process of equalisation of the temperatures take place at the commencement of the experiment, and the less the difference the more slowly is equilibrium brought about. Loss and gain are a function of the difference, and not of the absolute temperatures.

(vi.) *Conduction of Heat through the Tissues.*—All the tissues of the body may be said to be indifferent or bad conductors of heat, but fat is especially so to an unusual degree.

(vii.) *Action of Microbes.*—These microscopic bodies are chiefly concerned in decomposition (*q.v.*), but it is well known that an evolution of heat is associated with that part of their action which tends in the direction of decomposition. Witness decaying dungheaps, etc., which are always some degrees above the temperature of the air while

decomposition is still proceeding at all energetically. Whether they can thus act in delaying cooling is therefore at any rate possible, though it may be difficult to prove it.

(viii.) *Absorption of Heat by Water.*—Water has the largest co-efficient of absorption of heat of all known substances, or, in other words, water requires more heat per unit of mass to heat it than does any other substance.

It is obvious that when death ensues, and respiration and circulation cease, and the muscles remain inactive, the sources of heat are soon dried up, and the amounts available from still continuing cellular life in organs can only escape by simple conduction. Similarly the only source of loss of total heat is by conduction to the surrounding objects, including air and water, which may be in motion and thereby convect heat from the body.

A caution must be here inserted with regard to the exact meaning of the cooling of the *body*, and how it is to be determined. It is customary to judge of the coldness by placing the hand on the skin: this is very fallacious, inasmuch as it depends, first of all, upon the warmth of the observer's hand, a corpse may feel cold to a warm hand and warm to a cold one; and, secondly, the warmth of the skin of a corpse is not a good criterion of the warmth of the viscera.

Among the cases observed at Guy's Hospital in 1863 it was remarked that in several a high temperature was retained by the viscera for a long period after death. In two instances a thermometer indicated in the viscera a temperature of 76° F., in one instance seventeen and in the other eighteen hours after death, the temperature of the air being comparatively low (49° F.), and the surface of the body cool. In a third instance, ten hours after death, while the surface of the abdomen had a temperature of 65° F., the interior was 85° F. (Guy's Hosp. Rep., 1863, p. 193). In all observations on the temperature of the dead body a thermometer should, if possible, be employed. This may be applied for the exterior, either to the skin of the abdomen, or to the armpits; and for determining the temperature of the interior the bulb may be introduced into the mouth, throat, or rectum.

With this caution we are now in a position to appreciate the factors which are likely to promote or retard the cooling of the body. Thus—

Cooling is delayed by—	Cooling is hastened by— [Obviously these will be mostly the opposites to the other column.]
Connected with the Body.	
A. Acute pyrexial disease (strychnine poisoning may be included) as the cause of death, because of (*a*) the increased quantity of heat that has to be dissipated; (*b*) the continuance for a time of microbic working, if the disease be, as it probably is, of microbic origin.	A. Chronic apyrexial illness, especially if associated with wasting.

Connected with the Body—(contd.)

B. Sudden death in the midst of health, because all the tissues have a full and free supply of organic nutrient materials, which may continue to burn locally after death.	B. Lingering death.
C. Middle age, because here we have the most favourable proportions between subcutaneous fat and superficial area (for cooling by radiation) to actual bulk.	C. Extremes of age, because in babies there is such a great superficial area to actual bulk. (The fact that children have to grow, *i.e.*, that they are disproportionately concerned with anabolic activity, leaves them with but little surplus heat, a reason why babies should always be warmly clad.) Old age is usually associated with absorption of subcutaneous fat.
D. Asphyxial death. The cause is not quite so clear here, but it probably means the loading of the tissues with oxidisable materials combined with slackening of the circulation before death. Too much importance must not be attached to this statement, since in some cases of fatal asphyxia the body has been observed to cool just as rapidly as in death from other causes.	
E. Obesity, because of the bad conduction of heat by fat.	E. Leanness, because of absence of buffer of non-conducting material.

Connected with Surroundings.

F. Clothes on the body, because these, like fat, are bad conductors of heat.	F. Unclothed body.
G. Want of access of air, especially air in motion. It is by the movement of air round a body that the actual convection of heat is carried out.	G. Access of air.
H. The smallness of room or space in which the body is left. This is merely complementary to G.	H. Large room, bulk of air to be warmed.

Connected with Surroundings—(contd.).

I. Material on which it is laid. This, if soft, practically clothes the body and prevents access of air. If it possesses heat of its own, as, for instance, dungheaps, etc., the cause of delayed cooling is obvious.

J. The actual temperature of the air. This needs no comment. The warmer the air, obviously the slower the cooling.

I. Material. If the body lies on a hard substance, free access of air is again allowed.

J. Coldness of air.

K. Water. A body left in ordinary water, and especially in running water, always cools more rapidly than one left on land. The reasons are not far to seek: (*a*) large masses of water under ordinary circumstances are actually a little colder than the air; (*b*) the enormous specific heat of water (this is greater than that of any known common substance), which thus enables it rapidly to abstract and dispose of large quantities of heat, and yet to keep at a lower temperature than the body from which it is gaining heat. If the water is running in large bulk, so as to be comparatively uninfluenced by the sun, the above reasons hold with still greater force.

According to Richardson, a loss of blood, as in cases of death from hæmorrhage, whether the blood is effused externally or internally, or even temporarily withdrawn from the heart, as in syncope, is a cause of the rapid cooling of the body. He states that "the decline of the temperature in these cases is so great, that the external surface of the body may actually run down to that of the air without death" (*Med. Critic*, January, 1863, p. 31). The sudden cold of collapse observed on the surface of a living body is here confounded with the slow and progressive cooling of a dead body. The cases which have been adduced in support of this view are exceptional instances of disease, and have no practical bearing on the question at issue—namely, the cooling of the body after the sudden death of healthy persons from wounds. Hence the conclusion drawn from them, "If the body is left dead from direct and absolute loss of blood, cooling to the temperature of the surrounding medium is completed, in regard to the external surface, in two hours," may lead to a serious error, and implicate an innocent person in a charge of murder.

An opportunity of testing the accuracy of this statement presented

itself at Guy's Hospital in February, 1863. A healthy man, æt. forty-seven, died suddenly from hæmorrhage. A ligature had been placed on the axillary artery in consequence of an accident; this gave way, and about four pounds of blood were lost. Four hours after death the shoulders, chest, and abdomen of the deceased were quite warm. The skin of the abdomen had a temperature of 84° F.; eight hours after death the temperature was 80° F., and the arms and legs were not rigid. The conditions under which this body was exposed were favourable to rapid cooling: it was placed in a shell with a shirt loosely over it, and the temperature of the deadhouse was 38° F. The alleged effect of loss of blood in accelerating the cooling of the human body when death has occurred suddenly from hæmorrhage has therefore no foundation in fact. The only physical difference which it would be likely to create would be by simply reducing the amount of fluids in the body to undergo the cooling process. In the above well-marked case, the loss of four pounds of blood made no appreciable difference in the rate of cooling.

The following actual observations are interesting as records of cooling, but the method adopted was faulty:—

From January to June, 1863, Dr. Wilks and the author collected observations on the cooling of the dead body in one hundred cases at Guy's Hospital. The age, the cause of death, and the circumstances under which the bodies were exposed were at the same time noted. The reader will find the details of these cases in a table published in the Guy's Hosp. Rep., 1863, p. 184. A summary of the observations of temperature recorded in this table leads to the following conclusions: If the periods of time be divided, first, into those which are included between two and three hours; secondly, between four and five hours; thirdly, between six and eight hours; and fourthly, twelve hours, including one or two cases extending to fourteen hours, the results are as follows:—

	First period, 2 to 3 hours.	Second period, 4 to 6 hours.	Third period, 6 to 8 hours.	Fourth period, 12 hours.
Number of observations	76	49	29	35
Maximum temperature of the body . .	94° F.	86° F.	80° F.	79° F.
Minimum temperature of the body . .	60° F.	62° F.	60° F.	56° F.
Average temperature .	77° F.	74° F.	70° F.	69° F.

The temperature was tested by simply placing the exposed bulb of a thermometer on the skin of the abdomen. It should be remarked, however, that as the observations could not be commenced until the bodies were brought to the deadhouse, and a variable interval elapsed during which they remained in the wards, these temperatures are lower than they would be at the respective periods after death, as the body would necessarily cool to some extent before the first observation could be made. They, nevertheless, show that a dead body cools slowly and progressively, and that the trunk generally retains a well-marked warmth for ten or twelve hours after death.

It may be accepted as a general fact that the body is not cooled to approximately the temperature of the surrounding medium, air, in less than from twelve to twenty-four hours. Some writers on forensic medicine assume that the body cools at the rate of 1° F. per hour. But the rate of cooling is nearly proportional to the difference of temperature between the body and the surrounding medium, so that the rate of cooling becomes slower as its temperature approximates to that of the surrounding air (*vide* Rule V., *supra*). Soon after death a body may lose temperature at the rate of 4° or 5° F. per hour, and after the lapse of twenty hours may not lose so much as 1° F. of temperature per hour.

Goodhart has made observations as to the rate of cooling. Also Burman (*Edin. Med. and Surg. Journ.*, 1880, 25, p. 993) found the average rate of cooling to be 1·6° F. per hour. Niderkorn's observations give a rather more rapid rate. [Probably 1° C. (=1·8 F.) may be taken as the *average* rate of cooling during the first twelve hours after death.—Ed.]

If the circumstances under which a body is exposed are favourable to the loss of heat, it may be found cold in eight or nine hours after death.

Such are the commonly observed facts in the cooling of the body, but there are certain exceptional cases of which the explanation is not quite clear. There are numerous authentic observations which show that heat may be sometimes long retained by the dead body, both on the surface as well as in the cavities. This exceptional retention of heat has given rise to the erroneous suspicion that the person was still living, as in the following case, a report of which appeared in the *Lancet* some years since :—

A servant girl, who had retired to bed in apparently perfect health, was found on the following morning, as it was supposed, dead. A surgeon who was called in pronounced her to be certainly dead, and stated that she had probably been dead for some hours. A coroner's inquest was appointed for four o'clock of the same day to inquire into the cause of death; and directions were given that a post-mortem inspection of the body should be made in the meantime. The reporter of the case was requested to give his assistance. Accompanied by the surgeon who had been consulted, he went to the house about two o'clock for the purpose of making an inspection. The deceased was found lying on the bed in an easy posture, on her left side, her body forming something of a semicircle. The countenance was pallid, but so perfectly placid and composed as to give to her the appearance of being in a deep sleep. The temperature of the body, although she must have been dead eight or ten hours, was not in the least diminished. The room was carefully searched, but nothing in the shape of poison, nor any other means of self-destruction, could be discovered: every article of apparel lay around as it might be supposed to have been left by a person going to bed in perfect health as usual. The warmth of the body not diminishing, a vein was opened, and various stimuli applied, but without producing any sign of resuscitation. Respiration and circulation had ceased; no artery could be felt pulsating in any part. Two hours had now elapsed since their arrival, and the parties still hesitated to perform the inspection, when a message was sent to them stating that the jury were waiting for their evidence. The inspection was then commenced; but in moving the body for the purpose the warmth and pliancy of the limbs were such as to suggest to the examiners that they were inspecting a living subject. The internal cavities were so warm that a copious steam issued from them when they were laid open. All the viscera were healthy; there were no signs of disease; nothing appeared to account for death, and from what they saw the inspectors regretted that they had not postponed the examination until the signs of death had been more completely manifested.

For obvious reasons, the name of the place where this extraordinary case occurred and the name of the reporter were suppressed. It is probable that a high temperature was retained by this body for a much longer period than usual after death. There were, however, two physical causes in operation the influence of which does not seem to have been sufficiently appreciated. The girl died suddenly while in a state of perfect health and vigour, and until the time of inspection the body appears to have remained in bed closely covered by badly conducting materials; *i.e.*, the bed-clothes. The temperature of the room in which the body was found is not stated; but, as the month was October, it was probably not low. The temperature of the surface or of the internal organs was not determined by a thermometer. Although there can be no doubt that this girl was really dead, yet, as a rule, no medical man is justified in making an inspection of a body until after the signs of death (coldness and rigidity) have been clearly manifested. Respiration and circulation had ceased, and no pulsation could be felt in the heart or arteries; the body had been in this state for at least eight hours; hence it is evident that this was not a case of apparent death. The examiners were simply deceived by an unusual retention of heat in the viscera. Doubts were entertained for several days respecting the death of the well-known Professor Dieffenbach. The unusual retention of heat and the delay of the putrefactive process led to the supposition that he was only in a state of apparent death.

It is now well recognised that not only may the body retain its heat after death for an exceptionally long time, but that the temperature of the internal parts may actually continue to rise for an hour or two after death. The explanation is not so mysterious as it used to be thought to be, for, on the one hand, the influence of the life of the microbes producing a pyrexial death—*e.g.*, hyperpyrexia in rheumatism or septicæmia—need not be assumed to cease at once simply because the person has died, neither, on the other hand, need we assume that oxidation, which has been raised to what might be termed a conflagration by physical causes external to the body—*e.g.*, in heat stroke—upsetting the heat-regulating mechanism, should immediately cease with somatic death (*vide* Rule IV., *supra*). The following illustrations are taken from former editions:—

In some cases of death from epidemic cholera, when prevalent in this country in 1832-3, the body, which had become moderately cold, was observed suddenly to resume its warmth, so that the temperature is stated to have risen some time after death as high as 87° F., although circulation and respiration had entirely ceased. In another instance the temperature was observed to rise from 79° to 92° F. after death. According to Valentin, the occurrence of post-mortem heat is common to all dead bodies, the difference being only in degree. It is said to be most rapidly developed after death from injuries to the nervous centres, especially the brain. In cerebro-spinal meningitis the temperature has risen after death from 104° to 111° F., and in a fatal case of small-pox, attended with much delirium, Simon observed that the thermometer rose at death from 104° to 113° F. (*Lancet*, 1870, 1, p. 21).

In a case of death from epidemic cholera Rumsey observed that half an hour after the complete cessation of respiration and circulation the muscles of the arms underwent spontaneously various motions of contraction and relaxation, continuing for upwards of an hour, and that, although previously cold, they then became evidently warmer.

John Davy met with some very high temperatures in the *dead* body. In a case of rheumatism, after the viscera had been exposed for nearly ten minutes, a thermometer, placed under the left ventricle, rose to 113° F., and when in contact

with the lobulus Spigelii of the liver to 112° F. In a second subject, examined *six hours* after death, the thermometer under the left ventricle indicated a temperature of 108° F., and when in contact with the lobulus Spigelii 107° F. In these cases the patients were ill but a short time, and died suddenly; and the temperature of the apartment in which the observations were made was 86° F. This increase of temperature after death has been referred to putrefaction; but Dowler has shown that it takes place soon after death, and before rigidity sets in. Some of the cases reported by Wilks and the author also show that it may take place independently of putrefaction (Guy's Hosp. Rep., 1863, cases 4, 26, 30, p. 184). Dowler has called this condition post-mortem caloricity; he has noticed it as a common occurrence, in a warm climate, in the bodies of persons who have died from yellow fever. The heat of the body, according to him, continues to increase for several hours after death; and in one case, after six hours, he found the armpit to have a temperature of 100° F., and the abdomen one of 103° F. In another, the temperature of the armpit during life being 100° F., it was found that in three hours after death the temperature of this part had risen to 104° F.; in a third case, a similar increase was observed in thirty minutes. The highest post-mortem temperatures were observed in the thighs. Thus, in a case in which the armpit had during life a temperature of 104° F., in ten minutes after death it indicated a temperature of 109° F., and in fifteen minutes after death the thigh gave a temperature of 113° F. When the maximum, which is variable in different bodies, has been attained, the body gradually undergoes the cooling process observed after death, and, according to Dowler, this generally commences with the head (*Phil. Med. Exam.*, October and November, 1845, pp. 625 and 359). In death from epidemic cholera he found that the dead body reached its maximum temperature of 109° F. in about an hour and a half. Hensley published in the same journal a series of cases in old and young persons who had died from different causes; these do not show a similar increase of temperature, but they prove that after thirty hours a dead body may retain a temperature two or three degrees above that of the room (*ibid.*, March, 1846, p. 151). These observations may serve to explain facts similar to those observed in the case of supposed premature inspection just now related, for they show that in some exceptional instances a really dead body may retain for many hours a temperature as high, or higher, than that which is usually found in the living.

When there is a high temperature at the time of death, this may persist for some time. In 1885, a man was trephined in Guy's Hospital after sustaining a fracture of the skull with hæmorrhage into the cranial cavity. At death his temperature was 107° F. in the axilla, and this high temperature persisted for ten minutes after death, when it began to fall. In the same year a man died in the same hospital of malignant disease of the spine. His temperature fluctuated; but two hours and a half before death it was 97·6° F., whilst half an hour after death it was 102·2° F.

Dowler considers that the gradual loss of heat in the *interior* of the body, as determined by a thermometer, furnishes the best test to establish the reality of death. The living body maintains a uniform temperature independently of that of the surrounding medium; but a dead body, like other inert matter, is governed in its temperature by purely physical conditions (*Phil. Med. Exam.*, October, 1850, p. 606). It may be observed, however, that in temperate climates the signs of death are sufficiently well marked by the progressive cooling and rigidity of the body before the application of the thermometrical test to the interior could be made; hence, although it would furnish information that death had certainly taken place, a medical examiner could come to a safe conclusion without it. The occasional existence of post-mortem high temperature offers no objection to this conclusion, since cooling sooner or later follows this condition as a result of ordinary physical causes. The coldness of the living body in cholera, congelation, hysteria, etc., is a physiological condition, and not the result of physical cooling. If death takes place the coldness may continue, or the body may again become warm. In either case it passes ultimately, by physical cooling, to the temperature of the surrounding medium. To sum up these facts, as soon as death takes place the temperature either (*a*) begins at once to fall, or (*b*) commences to rise, or (*c*) continues to rise, if rising just before death. If it starts at once to fall it continues to do so till equilibrium of temperature is established between the body and the surrounding inanimate objects. If, on the other hand, it rises after death, it will continue to do so to a very variable point, and then it will commence to fall, and fall steadily to

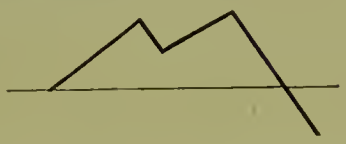
equilibrium, as in the former case. Graphically represented, the temperature will form a curve—



the usual one, or



but it will never form a curve like this:—



i.e., there is never an intermediate rise after death when once the fall has begun.

The final conclusion on all the above may then be drawn as follows:—Cooling of the body is a good criterion of death, and when it has definitely taken place a more certain reply to the question, "When did death occur?" may be given than when the internal temperature is nearly that of the living body; that is, we know of cases, more or less inexplicable, of retention of heat for unusual periods, but we do not know of inexplicable cases of rapid cooling.

4. Insensibility and Loss of Power to Move.

These small points are certainly concomitants of death, and must therefore be noted in a complete exposition of the "signs of death," but they certainly may be, and are, found in cases of death which is only apparent, and not real. Thus in the apparently drowned they are found, and not only so, but any perceptible heart-beat or respiratory movement is absent too, for a long time in some cases that ultimately recover entirely, a fact again calling for prolonged efforts at resuscitation. The same phenomena of insensibility and loss of power to move are witnessed in prolonged fainting attacks, in apoplexy at times, or even epilepsy, in trance, catalepsy, and the cases already mentioned of prolonged sleep; in fact, these two signs of death have by the laity had a very undue weight thrown upon them without attention being paid to the other more certain signs. The results have in some cases been appallingly disastrous. *Vide* "Premature Burial," *ante*, and also the following case:—

B. M. J., December 8th, 1877, p. 819.—A woman in a state of trance buried alive. The Appeal Court at Naples sentenced both the doctor who signed the certificate and the mayor who authorised the interment to three months' imprisonment for "involuntary manslaughter."

In fact, it may be said that all cases of premature burial that are genuine and authentic have arisen from this cause. In the cases

quoted under "Premature Burial," accident alone seems to have prevented catastrophes. Nothing further in the way of caution need surely be said.

5. Changes in the Skin.

After death the skin is observed to become extremely pallid and waxy-looking, owing to the absence of all circulation. In some parts as the body cools it becomes covered by livid discolorations (cadaveric hypostases); this is especially the case in those instances where death has taken place by sudden violence. One of the most striking changes in the skin is its entire loss of elasticity. In the living body, if any part of the surface be compressed, the skin will readily return to its original form on removing the pressure. Thus, in a doubtful case, a flatness of those parts which have been allowed to lie upon an even surface may be regarded as a sign of real death, provided the other concomitant changes are observed. It is almost unnecessary to remark that, if certain diseases have the power of depriving the skin of its elasticity, the history of these cases, or a superficial inspection of the body, will suffice to show to what cause the want of elasticity is to be attributed.

There is another condition of the skin in the dead which calls for notice, viz., its opacity. If the hand of a living person is held before a strong light, it will be found to be translucent and of a deep red colour from the translucency allowing of the red colour of the circulating blood being seen through the skin. The hand of a really dead person thus examined is stated to be in all cases opaque, owing to the opacity of the skin. In applying this as a test, we must remember that a horny or hardened state of the cuticle, or a diseased condition of parts, may interfere with the translucency in the living subject; it is always better seen in the young and in those whose hands are thin. In these cases the fingers appear to be formed of a mass of blood; they have a deep red tint, except about the joints, where the colour appears lighter.

In the living, light thus passing through the skin will actually display the spectroscopic appearances of blood if sent through a properly adjusted spectroscope. Such an experiment fails if attempted with a dead body.

6. Action of Heat on the Skin.

As a test of the reality of death this can only be very rarely required, but the matter assumes vastly more importance when the law demands an answer to the question, Were these burns found on a dead body, or portion of one, inflicted during life or after death? Inasmuch as the cases which have demanded this answer can more appropriately be introduced and discussed under the heading of "Burns" (Sect. IX.), only a very brief notice will be here introduced. Thus if a person have remained apparently dead for say twenty-four hours—and it is only in such extreme cases that the test can be of any use—the heat of boiling water may be applied to a very limited portion of say an arm or a leg; if death be real it is only a dry blister that will be produced. The epidermis may be raised considerably if the heat be applied for some minutes, but on pricking it no fluid, but air only, will

escape, and no redness in the surrounding skin will be produced, thus showing that circulation has ceased for some time, or, as Dr. Tidy ("Legal Med.," p. 41) sums up the position,—

"(1) If a blister on the skin, produced by the application of a flame, contains a serum rich in albumen, whilst the cutis vera, after the cuticle has been removed, presents a reddened appearance, more especially if, after a short interval, a deeply injected red line forms around the blister, absolute evidence is afforded of the vitality of the part to which the heat was applied, and exceedingly strong confirmatory evidence of the life of the person.

"(2) If a blister, formed by the application of flame to the body, contains air, or a little non-albuminous serum merely, the cutis vera after the removal of the cuticle appearing dry and glazed, more especially if, after an interval, no red line becomes visible around the blister, the evidence is absolute that the part so treated was dead, whilst the presumption is strong that the person himself was dead."

7. Changes in and about the Eye.

This is another of what may be called the subsidiary signs of death, of little use in themselves, but affording a certain amount of corroboration to the more important ones: cessation of circulation and respiration, etc.

(*a*) *Loss of Corneal Reflex.*—This is common to death and any other form of deep insensibility, *e.g.*, artificial general anæsthesia, apoplexy, uræmia, epilepsy, narcotic poisoning, etc., etc., not to mention its abolition by local anæsthesia, by cocain, etc., so that it affords but poor confirmation of the reality of death.

(*b*) *Clouding of the Cornea.*—This certainly affords stronger presumption of death, but inasmuch as it is well known to occur in certain diseases—*e.g.*, marasmic conditions, cholera, wasting diseases—under some conditions before life is extinct, it is very unreliable. Moreover, in some cases the cornea remains quite clear and translucent for some time after death without any obvious cause.

(*c*) *Flaccidity of the Eyeball.*—This, too, occurs speedily after death, but may also be noticed in some people during life.

(*d*) *State of the Pupil.*—The iris contains a large proportion of muscular tissue which during life enjoys, in common with all muscles, a certain "tone"; this tone is rapidly lost after death, and the iris dilates somewhat into a condition of equilibrium. Hence, if there are no circumstances interfering with this action, certain cases of poisoning by opium, etc., form the great exceptions, a dilated pupil becomes a small sign of death. The loss of power to react to light is another point; this reflex is very soon lost after death, but it must not be forgotten that it is also frequently lost during life, as in apoplexy, uræmia, etc. The action of drugs—atropine or eserine—continues probably for about an hour after death, but certainly not much longer. Their application to an eye under such circumstances is free from all risk, and may, therefore, be made when this form of evidence might be required to confirm the reality of death. Küssmaul states that no conclusion can be drawn, from the width of the pupils in death, as to the diameter which they presented at the latest period of life. This

statement is of some practical importance in reference to post-mortem appearances in cases of alleged narcotic poisoning.

8. Changes connected with the Blood.

A. Coagulation.—Into the physiological reasons for the coagulation of the blood it is here unnecessary to enter. It is sufficient to say that coagulation does not take place till the blood is dying, and that coagulated blood is dead blood. We must also accept the fact that when retained in its original vessels it coagulates very much more slowly than when it has been removed to a vessel of any sort.

The practical point is that the blood coagulates in most cases after death, but at a variable time after the cessation of the heart's action. When blood is removed from the living body, coagulation commences in from five to ten minutes. In the dead body, it probably does not commence until it begins to cool. Hence the fact of coagulation on removal does not prove that the person is living. Wilks has observed that when a body is examined eight or ten hours after death it is not unusual to find the blood which may have flowed from it as a liquid forming a firm clot; and that which is effused into the chest during the examination often forms after some time a very firm coagulum (Guy's Hosp. Rep., 1863, p. 183). It has been stated that the blood of persons killed by lightning does not coagulate, but this statement is erroneous. Certain diseases appear to influence the coagulation of the blood. Savory has observed that coagulation has been partial or imperfect in cases of death from delirium tremens; and it is well known that in rapid death from certain vegetable poisons the blood is found fluid and of a darker colour than natural, even when the examination is made soon after death.

Donné suggested that, in order to determine the reality of death before the access of putrefaction, a small portion of blood should be drawn from a vessel, and it should then be observed whether it coagulated or not. If, instead of a red homogeneous *coagulable* liquid, we obtain only a reddish-coloured uncoagulable serum, from which the particles speedily subside as a red sediment, we shall be justified in inferring that life has ceased—a conclusion at which we could not arrive if even the smallest portion of coagulum should be formed. This appears to be a fair physiological test, and easy of application. When the blood has once coagulated, there must be an arrest of circulation; and although it *does* become again fluid, this is only under the influence of putrefaction, and it does not thereby recover a coagulating power. One of the great characters of blood effused from a *living* body is, that it coagulates speedily after its effusion. Thus drops from an artery thrown on furniture or a wall speedily consolidate, assuming an oval or long elliptical form, the narrow point downwards, and at this part will be found the coagulum of fibrin locking up the red colouring matter. Blood sprinkled from a dead body is more liquid; it forms a long irregular drop or streak, and only dries up by evaporation (*vide* "Tests for Blood," *ante*.)

B. Post-mortem Bleeding.—This is a very important point to be noted, viz., that after death the arteries contract, and by their contraction empty themselves into the veins and capillaries, provided

that the blood is not coagulated too soon ; the heart having ceased to beat and the veins being much weaker than the arteries, the blood remains in the veins in a stagnant condition, and probably still uncoagulated. Under these circumstances, if a vein has been wounded before death it may bleed freely post mortem and give rise to a suspicion that the wound was produced ante mortem. The matter will be again referred to under "Wounds," but the following case may be here inserted :—

In 1871 a prisoner hanged himself in his cell at Newgate before the door. A warder, who found him thus suspended, passed his arm through the opening of the door and cut the ligature. The body fell forward on the floor. It was soon afterwards dragged to the further end of the cell. The body was then cold and becoming rigid. It was found that where the head had rested there was a small pool of blood (about six or eight drachms), and the floor was smeared along which the head had been dragged. The blood was of a bright colour, but there was no separation into clot and serum. On examining the head, Gibson found a scalp wound about an inch and a half long at the junction of the occipital with the parietal bone. The wound was not regular, but somewhat jagged, and there was no effusion on its edges. The wound had been produced, and the bleeding from it had obviously taken place, after death.

An accident of this kind gave rise to considerable discussion on the occasion of an inquest held at Oldham on the body of John Lees, killed in the Manchester riots, as also in the case of the Crown Prince of Sweden, who was supposed to have been poisoned. A similar flow of blood may take place from a large incised wound made shortly before death. This post-mortem hæmorrhage is facilitated by pressure, and on this was based that ancient test of guilt, the touch of the murderer.

C. Post-mortem Hypostases.—It was stated just now that the theories of coagulation of the blood were of no interest to the medical jurist. It must, however, be admitted that there are two points that do have a large bearing upon our present subject. These are (*a*) that in different diseases the *rapidity* of coagulation is materially different, and (*b*) that the blood does remain fluid in the vessels for a much longer time than it will do when once extravasated into the tissues or shed into a receptacle. Their importance will be presently noted.

The phenomenon we are now to discuss is essentially due to the fact that while the blood is still liquid (or when it has liquefied again after coagulation) and is contained in vessels which are larger than is necessary to hold it, and which, moreover, have come to a condition of positional equilibrium through loss of their vital elasticity, it obeys the universal law of gravitation and sinks to the lowest part of such potential (or actual) cavity, and furthermore the heavier parts of the blood—viz., the red corpuscles—have a tendency to settle first, and to the lowest part of all, in such places as the aorta, where space and absence of friction permit of such complete subsidence. This is also a point of some importance in judging of the position in which a body has lain during the hours succeeding to death (*vide post* under "Inferences"). The phenomenon of hypostasis itself consists in the appearance in the skin of the body of discoloured patches—slaty blue or reddish or dark red-black in early stages, varying to bright red or coppery, or even green, when decomposition has advanced—to which many different names have been applied (post-mortem hypostases, subcutaneous hypostases, cadaveric lividities, sugilations, vibices, post-mortem stains), of which probably the best is post-mortem hypostases or simple hypostases, founded as it is on the basis of the universally accepted theory as to

the method by which they are produced. These appearances have often been mistaken for the effects of violence applied during life, and serious mistakes have thence arisen. Innocent persons have been accused of murder or manslaughter, and have been tried on charges afterwards proved to be groundless. Christison refers to two cases, in one of which two persons were convicted, and in the other three narrowly escaped conviction, upon a mistake of this kind.

A man named Keir and his mother were tried on the Aberdeen circuit for the murder of the father of the man. This case excited great interest at the time, and for many years afterwards. The prisoners were condemned, but the only evidence of any weight against them was the appearance of a broad blue mark on the fore part of the neck, which the witnesses compared to that produced by strangulation. There was, however, great reason to believe, from their own description of it, that it was due to natural changes taking place after death. The other case occurred in Edinburgh. Three men left a public-house intoxicated and quarrelling with each other. On the next morning one of them was found expiring in a wood, and he died soon after he was discovered. Two surgeons deposed that they found the marks of numerous contusions all over the body; and upon this deposition the two companions of the deceased were committed, and subsequently tried for murder. On the trial, Bell and Fyfe proved to the satisfaction of the court that the apparent contusions were nothing else than the livid patches, or hypostases, which sometimes occur spontaneously on the dead body after many kinds of natural death. Of course, this led to the acquittal of the accused persons.

The Time when Hypostases occur.—They generally commence to form within a few hours (three or four according to some authorities, four to twelve according to others) of death. At first they form patchy or mottled areas, but experience in the post-mortem room shows that, by about twelve hours at any rate, they are complete in their permanent form by coalescence of the smaller areas. Disease doubtless plays some part in influencing the time of their appearance, for the precise time required for coagulation, whether in or out of the body, depends upon the *quantity* of fibrin present in the blood. This varies greatly in different diseases. Consequently the formation of post-mortem ecchymoses, depending as they do in great measure on the time that the fluidity of the blood lasts, will vary considerably according to the cause of death. Thus in acute inflammations, where the amount of fibrin in the blood is large, coagulation may precede the actual moment of death, and in fact be the cause of death. Hence cadaveric ecchymoses in such cases will be of limited extent and possibly slow in making their appearance. Conversely in other diseases, such as phthisis, where the quantity of fibrin in the blood is small, the blood coagulates slowly. Cadaveric ecchymoses in such cases will be extensive and rapid in appearance (Tidy, "For. Med.," p. 16). Hence disease must be noted as bearing on the matter, though the cases in which evidence on the point is required are more commonly those in which healthy persons have been killed by violence, homicidal or otherwise.

They are of Constant occurrence in all Bodies.—This statement the editor can fully confirm from a long experience in the

post-mortem room. It has been stated that they do not occur in the bodies of those who have died from loss of blood; this is certainly not in accordance with facts. To prove a universal negative is notoriously difficult, if not impossible; but the editor has been able to find them in all such cases that he has observed at the London Hospital. It is true that they have been in some cases inconspicuous, but they have been there all the same. They have been in general the more conspicuous the less pyrexial the death, though it is impossible to lay down any other rule than the one that they have never been absent in any bodies in the post-mortem room at the London Hospital.

They occur in the Viscera as well as in the Skin.—This fact is a most important one to remember, for the condition is liable to be mistaken for a congestion occurring during life or for one that has been the actual cause of death. Thus they are found in the *veins of the pia mater in the posterior fossa of the skull*, where they may be mistaken for the congestion of asphyxia or for that attendant on a meningitis. From the former it is very difficult to distinguish them except by the fact that if the congestion be due to asphyxia it is likely to cause actual turgidity of the veins and to be equally well marked over the hemispheres in the middle and anterior fossæ as well as the posterior. In hypostasis there will be no observable turgidity, and the condition of fulness will be in the lowest fossa (posterior in a supine—the usual—position of a corpse, anterior in a prone—the unusual—position). From the latter they are easy to distinguish by the absence in hypostasis of any pus or sticky serum: in inflammation one or both of these will be distinctly noticeable; moreover, in simple hypostasis the pia mater will have a clear glistening appearance which will be absent if inflammation has been present. The confusion between congestion without inflammation and simple hypostasis is frequently made by one who is unaccustomed to making autopsies.

In the dependent parts of the lung hypostasis is always found, and is frequently liable to be mistaken for the early stages of pneumonia. The diminished resistance offered to penetration of the finger through the substance of the lung is the most reliable difference; but it must be admitted that it is not always easy even after much experience to discriminate between a mere hypostasis and a condition due to active ante-mortem hyperæmia, especially if the latter be combined, as it so often is, with an escape of blood out of the capillaries; and the greatest caution must be exercised in expressing an opinion in a case that is doubtful from the absence of other distinguishing features, such as a similar condition in non-dependent parts, definite valvular disease of the heart, or definite bronchitis.

In dependent parts of the stomach and intestines hypostasis again is liable to be mistaken for inflammation. In the absence of definite lymph on the peritoneal surface, or pus, or actual hæmorrhage, the best distinguishing feature lies in the fact that on stretching the viscus the continuous black lines (the veins filled with blood) will break up into isolated lengths, with breaks between them if the condition is merely one of hypostasis; they will remain unbroken if inflammation is present.

They may resemble Marks of Violence (Bruises).—This is true on a superficial examination, but the points of distinction are several; these may be tabulated thus :—

Bruise.	*Hypostasis.*
1. Below the epidermis in the true skin in small bruises or extravasations, below this in larger ones, and often much deeper still. The reason is obvious, viz., that the epidermis has no blood-vessels to be ruptured.	1. In the epidermis or in the cutis, as a simple stain or a showing through the epidermis of underlying gorged capillaries.
2. Cuticle probably abraded by the same violence that produced the bruise. In small punctures, such as flea bites, this is not observed.	2. Cuticle unabraded, because the hypostasis is a mere sinking of the blood, and therefore there is no reason for abrasion.
3. Bruise appears at the seat of and surrounding the injury. This may or may not be a dependent part.	3. Always in a part which for the time of formation is dependent, *i.e.*, at a place where gravity ordains it.
4. Edges not sharply defined, because the extravasated blood soaks irregularly beyond the actual source of extravasation in the lines of least resistance to soakage or pressure of extravasation.	4. Edges sharply defined: simply indicates the level of the fluid still contained in the vessels.
5. Often elevated, because the extravasated blood and serum of subsequent inflammation force apart and elevate the tissues, making an artificial space which did not exist before.	5. Not elevated, because either the blood is still in its pre-existent vessels or at most has simply soaked into and stained the tissues and has not produced any artificial space.
6. Incision shows blood outside vessels. This is the most certain test of difference, and can always be appreciated even in very small bruises.	6. Incision shows the blood still in its vessels; and if any oozing occurs drops can be seen issuing from the cut mouths of the vessels.
7. Colour variegated. This is only true of bruises that are some days old, or at least one day; it is due to the changes in the hæmoglobin produced by decomposition under the influence of living tissues, and indicates that the bruise was made during (local tissue) life.	7. Colour uniform. The well-known changes of colour (green, yellow, etc.) produced in blood extravasated into living tissues would appear not to go on in dead tissues, and hence are not observed in cutaneous hypostasis.

Bruise—contd.	*Hypostasis—contd.*
8. If the body happens to be constricted at or supported on a bruised place, the actual surface of contact may be a little lighter than the rest of the bruise, but will not be white.	8. In a place which would otherwise be the seat of a hypostasis pressure of any kind, simple support (the wrinkling of a shirt or necktie, garters, etc.) of very slight degree is sufficient to obliterate the lumen of venules and capillaries, and so to prevent the entrance of blood; hence are produced white lines or patches of pressure bordered by the dark colour of a hypostasis. Marks of flogging, strangulation, etc., are thus sometimes simulated.

These points are sufficient, if carefully noted, to decide the question of whether a given mark was due to violence or not; but it must be admitted that feebleness of circulation in the aged, and sometimes that produced by cold, may resemble very closely the effects of violence. Such marks are, however, practically always found on parts, such as the ear, the shins, the fingers, or toes, where the circulation is comparatively poor, and where experience leads to their expectation.

It must also be allowed that there is one case on record (the editor is unable to find another such recorded or experienced) where the colour changes commonly found in a bruise have been seen in a hypostasis.

This is the case of a man who died in 1837, on board the *Dreadnought* hospital ship. The subject of this case, æt. 33, died suddenly from disease of the heart. Just before death the deceased had been auscultated, and no marks then existed on the skin. The body, after about eighteen hours, was examined, and then it was found to present, in detached places, patches of discoloration, varying in size from small spots to several inches in diameter. Although closely simulating bruises or marks of violence during life, a slight examination showed that they were owing to hypostasis, because those parts of the back and limbs which were not compressed by the surface on which the body of the deceased was lying were the only parts discoloured. The calves of the legs, the loins, and the back, which bore the pressure, were white. On cutting into these patches, the layers of the skin, as well as the tissues beneath, were throughout reddened by congested blood, and small rounded semi-coagulated masses oozed out from the cellular membrane on slight pressure.

These characters somewhat resembled those produced by violence on the living body; but there was another, and an unexampled circumstance, in which the resemblance to *vital* ecchymosis existed. Around many of the patches there was a wide border, or zone, of a pale straw colour, with various shades of green and blue, precisely similar to those which are seen in the gradual disappearance of an ecchymosis from the living body. By most medical jurists it has been hitherto considered that the zones of colour are peculiar to vital ecchymosis, and are never seen in the ecchymosis produced after death.

The occurrence of this case shows with what caution general rules should be framed for medico-legal practice. Had the body of this person been found lying dead and exposed on a high-road, and had it been proved that another man had been seen quarrelling with him, what might have been the opinion expressed? We can scarcely hesitate to say, unfavourable to the accused person. This kind of ecchymosis could have been distinguished from that of violence during life only

by the unruffled state of the skin and the slight effusion of blood compared with the extent of discoloured surface. The formation of the coloured zones around some of the patches of lividity was fully explained by the fact of the man having laboured under general dropsy. The serum effused in the cells here acted upon and diluted the liquid blood as it exuded from the vessels and diffused it around, much in the same manner as the serous exhalation of the cellular membrane acts on the blood effused in the living body. The evidence seems so conclusive that the case must be accepted notwithstanding its unique character.

On February 1st, 1904, in the post-mortem room of the London Hospital, the editor met with a case in which the upper margins of hypostases on neck and trunk had assumed a yellow tinge. The body was that of a woman who had died from cardiac failure owing to septic ulcerative endocarditis, with gangrene of the right hand. There was a little œdema of the tissues. On superficial examination the yellow discoloration was something like that seen in a bruise, but the shades of greens and blues were wanting, and the epidermis was quite intact, so that no mistake could arise when the coloured patches were carefully examined and cut open.

When decomposition commences the blood shares in the process, and hypostases undergo some changes in consequence : they may become of a coppery red colour, and may show even large veins running across them of a similar colour, or they may become bright or dull green ; at the same time the blood has again become liquid, and now soaks through the dead tissues as it would through any other permeable material. Hence it follows that when putrefaction has advanced it becomes, proportionately with that advance, difficult to distinguish between a bruise and a hypostasis, for the crucial test of finding blood actually effused from the vessels into the tissues becomes more difficult of appreciation. The difficulty with the other corroborative tests to apply is perhaps more academic than practical, but it is nevertheless well to exercise caution in giving an opinion when the body is very much decomposed.

A question connected with hypostasis was raised on the trial of Reid, namely, whether this cadaveric lividity always *preceded* cadaveric rigidity or not. Rigidity is not in general strongly manifested until the body is cold ; hypostasis takes place while the body is cooling and the blood is liquid. The occurrence of rigidity depends on the time at which muscular irritability is entirely lost, but post-mortem discoloration of the skin is closely connected with the presence of warmth in the body and with fluidity of the blood ; hence cadaveric lividity begins to develop itself often soon after death, and continues to increase until the body is cold, and the blood coagulated, when its formation is arrested until the blood again becomes liquid. As it has now been clearly proved that rigidity affects the heart and coats of the arteries before rigidity of the voluntary muscles manifests itself, it is highly probable that in the contraction of these tubes the blood is forced at first through the capillaries into the venous system, and afterwards, from want of sufficient power of propulsion, it stagnates unequally in these vessels, producing livid patches on the skin. Although the arteries are relaxed and become quite flaccid, the blood remains in the minute vessels in which it has collected. The question then must

be answered in the negative, not only on these theoretical grounds, but also on the ground that hypostasis occurs in those cases of instantaneous rigor (*vide post*, under "Instantaneous Rigidity").

9. Changes in the Muscles.

The first effect of death from any cause is in most cases a general relaxation of the whole of the muscular system. The lower jaw drops, the eyelids loose their tension, the limbs are soft and flabby, and the joints are quite flexible. In from five to six hours after death, and generally while the body is in the act of cooling, the muscles of the limbs are observed to become hard and contracted, the joints stiff, and the body firm and unyielding. This peculiar condition is known under the name of cadaveric rigidity or *rigor mortis*. The muscular tissue passes through three stages in a dead body. (1) It is, as above mentioned, flaccid but contractile, still possessing local life, although, as will be seen hereafter, muscles contracted by living force in the act of dying do not necessarily become relaxed in death; (2) it becomes rigid and incapable of contraction: it is now dead; and (3) it is once more relaxed, and does not regain its power of contractility: it now begins to putrefy. The first stage defines the duration of muscular irritability, the second stage that of cadaveric rigidity, and the third that of the commencement of chemical change or putrefaction.

To understand these three conditions, and thereby to be in a position to offer some explanation of the variations that occur after death, it is first necessary to give a very brief outline of some of the points in nerve-muscle physiology. This may most clearly and succinctly be done in the form of a series of propositions, all of which, with numerous details, will be found in any standard work on physiology.

(i.) Local life persists in muscles and nerves after the death of the body from which the muscle-nerve preparation is taken. This point has been already noticed in connection with the cooling of the body; unless it were a fact, none of the experiments with muscle-nerve preparations would be possible.

(ii.) The less damage in the way of pressure, pinching, etc., is done to a muscle-nerve preparation in removing it from the body, the better will it respond to experiments, and the longer will it last in a state of living activity.

(iii.) The better its state of health on removal—*i.e.*, the healthier the animal from which it is removed—the better subject is it for experiment.

(iv.) Its activity, or rather the amount of energy it can exhibit, after removal from the body depends upon several factors, amongst the better known of which are (*a*) the presence within it at the commencement of the experiments of products of its own activity (CO_2, sarcolactic acid, etc.): these rapidly reduce its power; (*b*) the possibility of the removal of these products (by normal saline solution or defibrinated blood, etc.); (*c*) the presence of definite myosin: this determines actual death, but there are known to be present in muscle certain bodies which are the forerunners of myosin itself, on the removal of which the muscle may still show signs of life.

Brown-Séquard found by experiments on rabbits that if a current of arterial blood is re-established through muscles in which cadaveric rigidity has already begun to show itself they cease to be rigid, and recover their irritability. He even succeeded in removing the cadaveric rigidity from the muscles of the decapitated body of a criminal thirteen hours after execution, and two hours after the supervention of rigidity, by the injection of defibrinated human blood. The muscles lost their rigidity, and continued to contract on irritation for several hours (*Gaz. Méd. de Paris*, Nos. 24 and 27; and *Amer. Jour. Med. Sci.*, January, 1852, p. 221).

(v.) No matter how carefully the preparation is made nor how little work it is made to do, a time will ultimately arrive when the preparation will die; and this time cannot by any artificial means (in warm-blooded animals at least, and they are the only ones that interest the medical jurist) be lengthened much beyond say eight or ten hours. In this death it becomes stiff or enters into rigor mortis.

A. Period of Irritability.

We may now consider the period of irritability of the muscles in its medico-legal aspects. In order to determine the reality of death, it has been proposed to test the irritability of the muscles by the application of an electric current. If a voluntary muscle, laid bare for this purpose, does not contract under the application of this stimulus, the inference is that the person is dead; but if it should contract under these circumstances, it furnishes no proof that the person is living, in the ordinary meaning of the word. The cardiac and other involuntary muscles, which are readily affected by a mechanical stimulus soon after death, lose their irritability or power of contraction, even under a galvanic current, much sooner than the voluntary muscles.

Contractility of the voluntary muscles under the current would, therefore, prove either that the person was living, or that the body was in the first stage of death. All the muscles do not retain this irritability under the electric stimulus for the same length of time, nor do they all lose at once their susceptibility of contraction. The voluntary muscles retain their irritability on the average about three hours. One degree of stimulus may excite them, while another may not.

Dowler has shown by numerous experiments on the recently dead body that post-mortem contractility may be excited by slight blows on the muscles given with the hand or any weapon, and thus electricity may be dispensed with. When the arm of a recently dead person was extended at a right angle with the trunk, a blow over the biceps muscle, not sufficient to injure a living person, caused the forearm to bend, carrying the hand to the chest repeatedly. In fact, before rigidity set in the arm of this corpse, by the mere effect of slight blows, performed supination, pronation, and flexion perfectly. This effect of slight mechanical violence is most distinctly observed within *half an hour*, but Dowler has seen it manifested as late as six or seven hours after death. It disappears when rigidity sets in ("Exper. Researches on Post-mortem Contractility," by Bennet Dowler, New York, 1846, p. 601).

It is a curious fact that the blood has no appreciable influence upon

the post-mortem contractility of the muscles, for when the limb was severed from the trunk, and drained of its blood, its action was not thereby diminished (*Amer. Jour. Med. Sci.*, October, 1846, p. 440). Contractions as the result of slight blows were observed in forty-three cases. The contractions were in many cases so forcible, as to cause a heavy weight to be lifted by the limb in which they occurred. The integrity of the corpse was not necessary; they were excited some hours after the dissection of the body, and after the limbs were severed from the trunk. Dowler considers that these muscular contractions have occurred spontaneously after the death of the body. Spontaneous movements in a corpse have been seen after death from cholera, and the same may take place after death from yellow fever and other diseases. Dowler suggests that the changes in the position of the limbs of bodies sometimes observed after death, which have given rise to tales of premature interment, may be explained by the occurrence of spontaneous post-mortem contractions, depending on the long retention of muscular irritability in a high degree. Haller endeavoured to lay down the order of cessation of this irritability in different muscles after death. Many physiologists since his time have also occupied themselves with this question. Haller found that it varied according to the kind of stimulus employed. Thus the irritability of the heart was excited by *mechanical* agents for a longer period than any other part of the muscular system, a circumstance which was supposed to account for the reports of persons having been dissected alive to be found recorded in some works on medical jurisprudence, an accidental puncture by the knife or forceps having given rise to contractions of this organ. But, to admit this explanation, we must suppose that the body was inspected within one or two hours after death.

Nysten concluded from his observations that the successive disappearance of muscular irritability in the bodies of decapitated persons took place in the following order: (1) the left ventricle of the heart, (2) the stomach and intestines, (3) the urinary bladder, (4) the right ventricle, (5) the gullet, (6) the iris, and (7) the voluntary muscles of the body.

The power of making the muscles contract under the electric current has been found to vary according to the nature of the disease of which the individual died. When it was such as to exhaust the strength, the time was very short. From experiments performed at La Charité it appeared that in death from peritonitis irritability ceased in about three hours; in phthisis, scirrhus, and cancer, in from three to six hours; in death from profuse hæmorrhage, or from mortal lesions of the heart, in about nine hours; in apoplexy with paralysis, in twelve hours; and in low fevers and pneumonia the irritability disappeared in from ten to fifteen hours. In these experiments the muscles of the trunk and limbs alone were examined, since it is upon these, should the necessity ever occur, that a practitioner must operate. Although the periods are thus laid down in figures, yet the results must be regarded only in the light of approximations to the truth; but the period of three hours may be accepted as the usual limit. On the other hand, in certain cases, as in the body of a decapitated man whose case is recorded by Nysten, the irritability of the muscles may remain for twenty-six hours after death.

These observations, which bear very practically on legal medicine, are all explained by the physiology briefly sketched above. The last sentence merely shows that when left undisturbed life may be preserved in a muscle longer than is generally anticipated.

B. Rigor Mortis.

The physiological data previously stated with regard to muscle-nerve preparations (it must be remembered that every muscle in the body is precisely identical with such a preparation) have shown that this period of rigor mortis is absolutely certain to arrive sooner or later, and they throw some light upon the reasons for its delayed or early appearance, and also upon the length of its duration. There are, in regard to its medico-legal relationships, several independent points to be considered, and these we shall take in the following order :—

1. The differences between living contraction of a muscle and rigor mortis.
2. The time of onset of rigor mortis.
3. The time of disappearance and the circumstances influencing it.
4. The order of its appearance and disappearance in different muscles.
5. Heat stiffening.
6. Rigor mortis in involuntary muscles.

(1) Contraction *v.* Rigor Mortis.

1. Contracted muscle is more or less transparent, or rather translucent.	1. Muscle in rigor mortis loses this translucency, and becomes opaque.
2. It is very elastic, *i.e.*, capable of restoration to its original form as soon as the distorting force has ceased to act.	2. It has lost this elasticity, and readily maintains a distorted position.
3. In reaction to litmus it is either neutral or slightly alkaline, and any reduction in this alkalinity is very speedily removed.	3. It is distinctly and permanently (until decomposition is advanced) acid in reaction, owing to the development of sarcolactic acid and probably other bodies of an acid reaction.
4. If the contraction be overcome by mechanical force, the muscles, though they may remain for a time uncontracted, possess still their inherent power of contraction ; they may then keep the limb fixed in a new position or allow a return to the old position.	4. If rigor mortis be overcome by mechanical force, absolute flaccidity corresponding in degree with the amount of mechanical movement at once ensues, and there is no power to resume the old position nor any new one, except so far as gravity may cause a new position. This flaccidity is permanent till decomposition destroys the muscle.
5. The contracted muscle contains only some of the antecedents to myosin.	5. Rigor mortis is due to and caused by the appearance of myosin or coagulation of muscle plasma.

CONTRACTION *v.* RIGOR MORTIS—(*contd.*).

6. Contractions in muscles cause movements of the limbs.	6. Rigor mortis may apparently do so according to the order in which it appears in flexors or extensors; but movement is not an essential result of rigor, although the muscle assumes a prominence as though contracted. It is asserted, however, that a dead body left entirely alone has a tendency to assume in rigor mortis a flexed position of the limbs.

By these tests taken collectively conditions of tetanus, catalepsy, hysteria, syncope, and asphyxia could be differentiated, if it were necessary, from a state of real death. Inasmuch as so many other unequivocal signs are, however, sure to be present, such as warmth, heart-beat, etc., such a test can rarely be even proposed.

(2) TIME OF ONSET OF RIGOR MORTIS.

It generally commences within five or six hours of death, while the body is engaged in the act of cooling, but long before it has reached the temperature of the surroundings. To this general statement there are, however, very numerous exceptions, some of which can be explained by the well-known principles of physiology mentioned above, while others hardly admit of such satisfactory explanation. Its onset is entirely a matter concerning the muscles only, and is wholly independent of the integrity of the nervous system, for a division of nerves leading to particular muscles and even the entire removal of the brain have not been found to prevent or even retard its occurrence if other conditions are the same; it also occurs in amputated limbs.

Thus it is easy to understand that it should come on slowly in healthy, muscular subjects who have died rapidly without convulsions, as, for instance, by decapitation, by sudden hæmorrhage, by judicial or even other forms of hanging; in such cases the muscles have no more than the average amount of decomposition products in them, and have their usual active circulation through them at the moment of death, conditions very favourable to the continuance of local life, of which it must be remembered that rigor marks the end. In actual experience Nysten found that there was muscular irritability in the body of a decapitated man twenty-six hours after the head had been severed from the body; and Brown-Séquard states as the general result of his experience that in the bodies of healthy persons decapitated or asphyxiated, cadaveric rigidity did not appear sooner than ten or twelve hours after death, and that it lasted more than a week even when the weather was warm. He has found in the muscles of the limbs of two decapitated men some degree of irritability thirteen and fourteen hours after death.

It is also easy to offer, in some measure, an explanation of why it should set in rapidly in new-born infants. Their muscles are engaged in a very active process of growth, and consequently have no large reserve

of energising materials available for continued local life. As an instance of this the following is taken from the epitome of the *B. M. J.* for 1903 :—

Ante-natal Rigor Mortis. — Paddock (*Amer. Jour. of Obstet.*, August, 1903) reports two cases of this condition, and refers to several others recorded since that of Chowne published in the *Lancet*, 1840. The author's first case occurred in a quadripara, aged thirty-five, in labour near term with a history of twelve hours' hæmorrhage. The child was transverse, with the hand prolapsed. Version was performed as soon as possible, and was rather difficult owing to the rigidity of the child. When extracted the lower limbs were still slightly stiff, and the arms markedly flexed and rigid. The rigidity did not return. Fœtal movements had ceased for ten hours. No attempt had been made to hear the fœtal heart. The second case occurred in a primipara, aged thirty, in labour at term. The labour was slow, and the membranes ruptured early, and five hours later the fœtal heart could not be heard. The fœtus was extracted by forceps later on, and was in pronounced rigor mortis. The sensation is described as like extracting a half-frozen fœtus from a mannikin. The child was large, very muscular, and well nourished. Rigor was in the second stage and remained so for at least two hours. When present there is no doubt that rigidity does interfere with delivery, in spite of statements to the contrary. Of the various conditions associated with ante-natal rigidity, hæmorrhage seems the commonest. Two other cases will be found in *B. M. J.*, vol. 1, 1904. The whole subject of ante-partum rigor mortis is fully discussed by Dr. J. W. Ballantyne ("Teratologia," vol. 2, April, 1895, p. 96).

It may be here noted, *en passant*, that rigor mortis is thus proved to be of no value as a sign of live-birth (*q.v.*).

Again, it is quite in accord with our data that all circumstances which cause an exhaustion of muscles during life should induce an early occurrence of rigor mortis. Thus violent exercise or exertion just before death accelerates the onset of rigor, as is well seen in hunted animals, in overdriven cattle, in cases of poisoning by strychnia and other convulsant poisons, and of which the following are good examples. The bodies of soldiers killed in the early part of a battle become rigid slowly, while the bodies of those who are killed at the close, after many hours of violent muscular exertion, become rigid almost immediately.

The effects of strychnine and other poisons which produce convulsions may be explained by reference to their action on the muscles. Rigidity has been observed to set in with great rapidity in animals destroyed by strychnine or by veratrine. Küssmaul made a similar observation in reference to the action of coal-gas on the system. Brown-Séquard noticed that when death was produced almost at once by these poisons, or by others having a similar mode of action, *e.g.* atropine, morphine, oxalic acid, and mercuric cyanide, there was hardly any effect observed on the time of access and duration of rigidity and putrefaction; but when convulsions had existed a long time before death, the influence was most remarkable. He poisoned three healthy dogs, as much alike as possible, with acetate of strychnine. One of them had a dose of two grains, another of half a grain, and the third of one-fourth of a grain. The first dog died at once; the second after

twelve minutes, during seven of which it had convulsions; and the third after twenty-one minutes, during eleven of which it suffered from convulsions. The following are the tabulated results in reference to the duration of muscular irritability and of cadaveric rigidity, as well as of the occurrence of putrefaction :—

	Durat. of musc. irrit.	Durat. of cad. rigid.	Putrefaction.
1st dog	8 hours	19 or 20 days	Slow.
2nd dog	2½ ,,	5 days	Rapid.
3rd dog	½ ,,	Less than a day	Very rapid.

In other animals which were killed by poisons causing convulsions, the more violent and frequent the convulsions were, the sooner cadaveric rigidity set in after death; and the shorter the time that it lasted, the sooner also did putrefaction appear, and the more rapid its progress. In reference to the author's own experiments, a rabbit died from the effects of half a grain of strychnine in twenty-three minutes; during the last eleven minutes it had several fits of convulsions, and died in one of these. In ten minutes after death, rigidity showed itself in the hind legs, and rapidly spread throughout the body. The rigidity had decreased in two days, and had nearly disappeared in four days (Guy's Hosp. Rep., 1856, p. 379). Clegg has communicated the case of a woman who died in September, 1864, from the effects of a large dose of strychnine, whose body passed rapidly into a rigid state. The strychnine, mixed with laudanum, was taken about 8.30 a.m., and she was found dead in a field, with the limbs rigid, and the body quite cold, at 11 a.m. There was slight warmth in the armpits. The deceased was fully dressed, and the weather was warm for the time of the year. In the body of a strongly built woman, who died of hydrophobia with violent convulsions, Brown-Séquard found that cadaveric rigidity had set in within the first hour after death, and that it had ceased before the end of the tenth hour.

(3) When does it Disappear?

Although muscles in which none of the micro-organisms concerned in decomposition (*q.v.*), were capable of demonstration have been found flaccid, there can be no reasonable doubt but that the exit of rigor mortis is very rapidly followed by the entrance of putrefaction, if indeed the two are not actually cause and effect. Thus it has been suggested, though not actually proved, that flaccidity following rigor mortis is actually caused by a solution of myosin in ammoniacal alkaline liquids produced by putrefaction. There can be no doubt of the fact that those circumstances at death which tend to leave a muscle full of products of its own disintegration, presumably unstable organic bodies, tend to shorten the duration of rigor mortis and to hasten the onset of decomposition. These are precisely the conditions which, we have seen, hasten the onset of the stiff condition, and from these facts the well-known rule follows as a matter of course, viz., the sooner rigor mortis sets in the more quickly it disappears and gives way to putrefactive processes. Of this the following is a good example :—

Brown-Séquard mentions the case of a man, who died in one of the Parisian hospitals in 1849, in whose body cadaveric rigidity appeared three minutes after he had ceased to breathe, and while the heart was

still beating twenty times in a minute, while the man was still alive, if life is considered to persist so long as the heart beats. These beatings did not cease till three minutes and a half after cadaveric rigidity had shown itself everywhere. A quarter of an hour afterwards there was no trace of cadaveric rigidity, and in less than an hour after death signs of putrefaction had appeared in the limbs. This man died of exhaustion after prolonged typhoid fever (Savory, "On Life and Death," p. 196).

On the other hand, myosin is soluble in acids, and the view has been put forward by Hermann that the disappearance of rigidity is due to solution of myosin by excess of acid produced during the continuance of rigidity.

Speaking in general terms, rigor mortis lasts for from sixteen to twenty-four hours in sound, muscular subjects; it may last much longer, from twenty-four to thirty-six hours, but exceptionally it may continue for fourteen days or even longer. In a case in which the author was consulted, a stout muscular man died suddenly from an attack of apoplexy. His body was exhumed and examined three weeks after death in the month of January. It was in a good state of preservation, and the limbs were so rigid that it required a great degree of force to bend them. No doubt in this case cold favoured the continuance of rigidity. Symonds also saw a body in a state of rigidity eight days after death by hanging.

We must now discuss some of the practical circumstances that influence its duration and consider how far they are susceptible of explanation.

The Influence of Atmospheric Conditions.—Atmospheric changes appear to modify considerably the duration of this state. Dry and cold air will cause it to persist for a long time; and thus it is that during the winter season, especially in a frost, it is slow in disappearing, its mean duration being then from twenty-four to thirty-six hours. If the air is warm and saturated with humidity, it soon ceases. Temperature appears therefore chiefly to affect its duration and intensity. Sommer found that, other things being equal, bodies became rigid as quickly in an atmosphere of from 59° to 63° F. as in one from 77° to 81° F.; but that the bodies of strong persons continued rigid for eight or ten days at a temperature of from 36° to 45° F., while it totally disappeared in from four to six days when they were exposed to a temperature of from 65° to 86° F. Bodies sunk in cold water soon pass into this state, and retain the rigidity for a long time. Water is a better conductor of heat than air, and tends to retard putrefaction.

The influence of temperature upon rigor mortis has been insufficiently determined. At the trial of Birchall for the murder of Mr. Bernwell at Woodstock, Ontario, in September, 1890, the medical witnesses were at variance. Bernwell was shot in the head, and must have died instantaneously. The temperature of the atmosphere was 22° F., and the deceased's body when found was rigid and frozen. Welford, for the prosecution, deposed that at the temperature of 22° F. rigor mortis would supervene in from one to three hours; whilst Means, for the defence, swore that the above degree of cold would retard the onset of rigor, which would not set in till after the lapse of twelve hours. These facts will be found to depend upon the causes of decomposition, and will be again referred to under "Decomposition."

The Influence of the Nature of the Death in Ordinary Diseases.—It has been long observed that the bodies of those who are emaciated, or who die from debilitating diseases, such as phthisis, typhus or typhoid fever, and epidemic cholera, pass rapidly into a state of rigidity, which is commonly of short duration. Hence, owing to want of correct observation, it has been erroneously stated that cadaveric rigidity did not occur in such cases. In reference to deaths from epidemic cholera, Brown-Séquard observed that cadaveric rigidity appeared late and lasted long in those patients who died quickly, that is, before a prolonged alteration of nutrition, and that those muscles which had been attacked with violent and frequent cramps became rigid very soon after death, and remained so only for a short time. Ollivier found that the bodies of cholera patients were frequently rigid in from six to eight hours after death, while the muscles which were the seat of this rigidity were still warm, and on making an incision into them the blood readily flowed out. The editor has noticed in the post-mortem room at the London Hospital that, whereas in the majority of bodies rigor mortis is well marked, it is frequently absent in the bodies of those who have died from generalised septicæmia; and especially has this been the case in separate limbs which have been the seat of purulent infiltration amongst the muscles. This is a most striking phenomenon, owing to the contrast between the rigid and the flaccid muscles. No definite record has, however, been kept of the exact time after death at which the autopsies have been made.

In this case the duration is obviously in strict accord with the condition of the muscles in regard to the amount of products of disintegration still present at the time of death compared with the activity of healthy circulation through them (*vide supra*).

The Influence of Death by Lightning.—It has been stated that in this form of violent death rigor mortis did not occur. John Hunter thought that cadaveric rigidity did not occur in this mode of violent death; but Brodie found that the body of an animal killed by electricity became, as usual, rigid after death. In an accident which occurred in France in August, 1846, a group of labourers were struck by lightning. Four were killed on the spot, and five or six severely wounded. It was remarked that the person whose body bore the most extensive marks of injury had worn a goat-skin. There were several lacerations about this body, and in three hours after death it became perfectly rigid (*Med. Gaz.*, vol. 38, p. 351). In another case of death from lightning, rigidity was strongly marked in the limbs about twenty-eight hours after death (*Med. Gaz.*, vol. 47, p. 844). In May, 1854, during a storm a man was struck by lightning. He made a short exclamation, and immediately expired. It was observed in this case that the body became rigid after death.

Facts are now sufficiently numerous to enable us to say that the old opinion of the non-occurrence of rigidity in the bodies of persons killed by lightning is unfounded. Bagot met with it in a case which he examined in the summer of 1855, in which the body of a man, æt. 28, who had been killed by lightning, was as rigid twenty-eight hours after death as if death had taken place from any other cause. The researches of Brown-Séquard afford a satisfactory explanation of the differences among physiologists upon this question. In some instances, no doubt,

cadaveric rigidity has set in, and has been of such short duration that it has not been possible to ascertain its existence. Death by lightning may be the result (1) of syncope by fright, or in consequence of a direct or reflex influence of lightning on the vagus nerve; (2) of hæmorrhage or bleeding in or around the brain, the lungs, or pericardium; and (3) of concussion or some other change produced by the electricity on the brain and nervous system. When death by lightning is due to any one of these causes, cadaveric rigidity may appear and run through its course rapidly, as in some other cases of sudden death. But (4) lightning may destroy life like a powerful electric shock, by producing such a violent convulsion of every muscle in the body that muscular irritability ceases almost at once. The rigidity in this case may be of such short duration as entirely to escape notice. Lightning may indeed reduce the duration of muscular irritability to the fraction of a second, and that of cadaveric rigidity in a corresponding degree, so that no trace of it may remain even a few minutes after death (*op. cit.* p. 209). Ranke has made the curious observation that there is a difference in the conducting power of living and dead muscle in reference to electricity. He found that dead muscle was a much better conductor than living muscle; and he traced this increase in conducting power to the presence of certain products of decomposition which do not appear until after death.

The Influence of Death by Poison.—We have already (*vide supra*) drawn attention to some of the effects of poisoning by strychnine, and laid down a general rule on convulsant poisons, bearing on the *onset* of rigor mortis in such cases. We have here to note an apparent exception to the rule of "Soon come, soon gone," for the rigidity produced as a result of poisoning by strychnine may sometimes continue for a very long period. Thus, in the case of *Cook* (*Reg.* v. *Palmer*, C.C.C., May, 1856), the body, when examined on the sixth day after death, was in a state of rigid spasm, and some of the members were found in a similar state on the exhumation of the body two months afterwards. It is worthy of remark that Cook lived only twenty minutes after the symptoms first appeared. He suffered from a few convulsive fits, but not sufficient to exhaust the irritability of the muscular system.

This fact has an important bearing on cases of poisoning by strychnine and other spinal poisons. The state of the dead body will vary according to the rapidity of death, and the degree of exhaustion of muscular irritability at the time of death, as a result of the fits of convulsion produced by the poison.

Of other poisons it may be said in general that those which have an antiseptic action, such as arsenic, mercury perchloride, etc., are likely to cause a delay in putrefaction, and hence a prolonged state of stiffness in the muscles; others are likely to be quite indifferent in the matter unless causing great exhaustion; while some seem to have a tendency to induce rapid decomposition. Of the latter coal-gas, at any rate sometimes, must be taken as an example, according to a case communicated to the editor by Dr. W. W. Brown, of Leeds, in which a man who had committed suicide by coal-gas was found "absolutely black, and in such an advanced state of decomposition that I was unable to make a detailed examination of the organs." The case is not, however, very complete, as Dr. Brown does not state the exact

time after death at which he saw the body. He remarks "he had not been seen alive for a week," nor does he give any particulars as to previous health and habits of the deceased, nor of the atmospheric conditions to which the body was exposed as well as to the coal-gas.

In a case of suffocation by charcoal vapour, Nysten observed that rigidity did not make its appearance until *sixteen* hours after death, and it is stated to have lasted for the long period of *seven* days. In other instances of suffocation, this protraction of cadaveric rigidity has not been noticed.

Rigidity is said to be slow in manifesting itself in death from hæmorrhage, irritant poisoning, apoplexy, wounds of the heart, decapitation, as also in all cases of asphyxia, especially in death from hanging, or from the action of carbonic acid. In a case of suicide from a fatal wound in the throat, observed by Handyside, the rigidity of the muscular system commenced while the body was yet warm, and was complete in *one hour and a half* after death. This early occurrence of rigidity cannot be referred to any influence produced on the muscular system by loss of blood. In a case of death from hæmorrhage, in which four pounds of blood were suddenly lost from the axillary artery, it was observed that eight hours after death the arms and legs were pliant; and it was not until twelve hours after death, when the body was becoming cold, that rigidity manifested itself. Death by hæmorrhage, therefore, does not accelerate this condition; it appears to have no more influence upon the period of its occurrence than it has upon the cooling of the body. So, with regard to irritant poisoning in an acute form, no difference was observed in reference to the rate of cooling or the commencement of rigidity in a well-marked case of death from arsenic in eleven hours. These cases easily fall in with our physiological postulates for explanation.

(4) The Order in which it appears in Different Muscles.

According to Nysten, cadaveric rigidity first appears in the muscles of the trunk and neck; it then takes place in the muscles of the upper extremities, and lastly in those of the lower. In regard to its disappearance, the muscles of the lower extremities will often be found rigid, while those of the trunk and upper extremities are again in a state of relaxation. It appears later and lasts longer in the lower extremities than in other parts of the body. Later observers have to some extent corroborated Nysten's statements regarding the commencement and diffusion of rigidity. Thus it begins almost always in the neck and lower jaw. Sommer found only one exception to this rule in examining two hundred dead bodies. From the neck it passes in two directions: upwards to the muscles of the face and downwards to the muscles of the upper extremities and trunk, then attacking those of the lower extremities. In the particular limbs, it commonly proceeds from above downwards, and it generally passes off in the same order. It always sets in, increases, and decreases imperceptibly and gradually, in which respect it differs strikingly from the rigidity of muscles as a result of disease (Küssmaul, *Vierteljahrsschr. f. Prakt. Heilk.*, 1856, B. 2, s. 67; see also a translation by Moore, *Dublin Quart. Jour. Med. Sci.*, 1856, vol. 22, p. 490). A more recent observer,

Larcher, who states that he has examined more than six hundred dead human bodies, as well as the bodies of a great number of animals, assigns the following course unless convulsions may have been present at the time of death: it commences in the lower jaw, affects the lower limbs, and afterwards the neck and the upper limbs. Those muscles which are the first to become rigid are the longest to retain rigidity ("Ann. d'Hyg.," 1869, 1, 469). This last statement is in direct contradiction to the experience of Professor Dixon Mann, who states ("For. Med.," p. 49) that the muscles which first become rigid are the first to lose their rigidity.

(5) Heat Stiffening.

The following is quoted from Professor Dixon Mann ("For. Med.," p. 45) :—"The rigidity of a cadaver that is fully under the influence of ordinary cadaveric rigidity may be increased by subjecting the body to a temperature of 75° C. The explanation is, that other albuminates present in the muscles besides myosin are thus coagulated. Myosin coagulates in mammals about 50° C., another albuminate coagulates at 47° C., and serum-albumen coagulates at 73° C. If, therefore, either before or after the full development of cadaveric rigidity, the body is subjected to a temperature exceeding 73° C., but short of causing disintegration, all these albuminates are coagulated, and a higher degree of rigidity is produced than that dependent on natural causes." It is a point which might be of importance in bodies taken from a burnt building or found burnt under other circumstances.

(6) Rigor Mortis in Involuntary Muscles.

It cannot be too strongly insisted upon that the involuntary muscles are subject to cadaveric rigidity as well as the voluntary, and, by reason of the more speedy loss of muscular irritability, it appears in them more rapidly. The ventricles of the heart commonly lose their irritability within an hour after death. They become rigid, and remain in that state for ten or twelve hours, sometimes for twenty-four or thirty-six hours, then again becoming relaxed or flaccid (Carpenter). Duval saw the heart of a criminal a quarter of an hour after decapitation beating with great distinctness. The left auricle in particular exhibited strong and regular action, forty-four times in a minute, and continued to do so for an hour (*Prov. Med. Jour.*, September, 1851). At a certain period after death the heart becomes rigid and firmly contracted. If examined at this time, it may appear to be in a state of spasm and to have its walls thickened, while the cavity of the left ventricle may be described as being much smaller than in the normal state. Paget has pointed out that this natural condition of the heart after death has led to pathological mistakes, the walls being described as thickened and the cavities being diminished in size, and the heart itself as being in a state of concentric hypertrophy from disease. On the other hand, the perfect relaxation of the heart which follows at a later period after death has been mistaken for and described as a morbid flabbiness and flaccidity. Spasms and paralysis cannot be inferred to have existed when we discover these conditions of the heart in the dead body.

The point is of enormous importance with regard to deductions

made as to the exact cause of death from the post-mortem appearances of the heart and bloodvessels of the brain. Thus it is too readily assumed that death was caused by asphyxia (*q.v.*) because the heart is found relaxed and full of blood, or because the meningeal vessels are filled with blood. It cannot be too strongly insisted upon that under the ordinary circumstances of the time at which post-mortems are usually made the amounts of blood *still within heart and vessels* may be ignored, in forming such conclusions, to any extent that circumstances may warrant, and *entirely ignored if there is no other evidence of how death was caused.* If blood is *extravasated out of the vessels* the *arguments are* quite altered (*vide* "Asphyxia").

C. Instantaneous Cadaveric Rigidity.

We have now to consider a phenomenon which lies quite outside any of the laws hitherto considered regulating ordinary rigor mortis, and yet one of the most important in the whole range of legal medicine, owing to the far-reaching conclusions which proper observations of a dead body allow.

A few isolated observations must first be made regarding the relation between ordinary contractions of muscles and rigor mortis. The power with which these organs contract in a state of rigidity is far less than that observed when they are subjected to the influence of volition in the living body. The contractile force is not so great as to induce any apparent alteration in the position of the parts to which the tendinous extremities of the muscles are attached, so that there is no displacement, nor is any force of a counterbalancing nature manifested between flexors and extensors. It is asserted that the flexor muscles are usually more contracted than the extensors, so that the limbs and trunk as well as the fingers, if left undisturbed in the dead body, have a tendency to assume a state of flexion. As a general rule, however, the position in which the muscles may be, at the time of death, is that which they retain during the state of rigidity, whether the body be lying, sitting, or standing, and whether the limbs be in a state of flexion or extension; but a peculiar condition of the *hands* of the dead, observed by Villermè, would tend to show that in dying the fingers assume a certain position by virtue of the contraction of the flexor muscles connected with them, although it is not quite established whether this contracted state of the fingers takes place at the same moment with the commencing rigidity of the body, or whether it is not an immediate consequence of dissolution. Villermè has remarked that in a dead body the thumbs are always bent inwards towards the palms of the hands, the apex of the thumb being opposite the base of the little finger and the thumb itself being covered by the four fingers of the hand. Villermè found this condition in many dead bodies which had not been disturbed. Devergie supposes that this position of the thumbs depends on a convulsive action of the fingers at the last moment of life; and as death may take place without any convulsive action, the appearance may be in some instances wanting. This sign of death will be found in a large number of cases where there has been no interference with the hands ("Ann. d'Hyg.," 1830, 2, 420).

Coagulation of myosin will not alone explain even these small facts

in rigor mortis, and we are compelled at once to admit that an act of contraction is also concerned in the matter, and physiologists in general are now practically agreed that this is so, and that the statement made above in "physiological data," that the condition of the nervous system has no influence upon rigor mortis, must be limited to saying that it has no influence in preventing the ultimate onset, but that it has material influence upon the time of onset and the degree of rigidity. The following quotation from Dixon Mann ("For. Med.," p. 47) shows this:—

"Bierfreund divided one ischiatic nerve in recently killed animals, and invariably found that rigidity was delayed on the injured side. Hemisection of the spinal cord below the pyramidal decussation was also followed by delayed rigidity of the side on which the cord was divided. The effect of cutting off the communication with the nerve-centres was strikingly displayed in a dog in which the left cerebral cortex was stimulated during life, producing right-sided convulsions; the right half of the cervical cord was subsequently divided, and the animal was then killed. The effect of the convulsions would have been to hasten the onset of rigidity on the side on which they occurred, if no subsequent steps had been taken. The result of cutting off the communication with the brain on that side, however, was that, on examining the extremities four and a half hours after, the left side was pronouncedly stiff, whilst the right side was almost as movable as at the time of death. Two hours later there was still a marked difference between the two sides. The body of a man who died forty-eight hours after an attack of apoplexy also showed delayed rigor on the paralysed side."

Now, on p. 263 it is stated that immediately after death the muscles enter into a state of relaxation, though they are still irritable and capable of being stimulated into contraction. The point that has now to be considered is the undoubted fact that THIS PERIOD OF FLACCIDITY MAY BE ABSENT, and that the body may be INSTANTANEOUSLY STIFFENED in the position it was in at the MOMENT OF DEATH.

We may first illustrate the general facts upon which the statement itself is based:—

Military men report that dead bodies are sometimes found on the field of battle stiffened in the attitude of kneeling or sitting with their weapons clenched firmly in their hands. There has been no relaxation in death, but the muscles appear to have at once passed from a living contraction into a rigid condition. This also throws light upon a fact to be presently noticed: that suicides are sometimes found with weapons grasped in their hands, and their bodies stiffened in the attitudes in which they have died. It may be inferred in these cases that, from some cause operating during life, the muscular irritability was exhausted at the time of death. Hence the greatest differences are observed to exist in regard to the commencement of cadaveric rigidity and putrefaction, in consequence of the variable degree of muscular irritability at the time of death. Brinton has recorded his experience on this curious subject during the American civil war of 1862. In many who had died instantaneously from brain and heart wounds, the body was rigid throughout, and the position was that of the last moment of life. He has called this *instantaneous rigor*. After the battle of Antietam, he counted within a small space forty dead bodies, mostly with chest wounds. There were some with their arms raised rigidly in the air, and others with their legs drawn up and fixed. In not a few the body was curved forwards and fixed. These attitudes were not those of the relaxation of death, but were rather of a seemingly active character, the muscles remaining rigid and inflexible as the result of spasmodic muscular action in the last moment

of life (*Amer. Jour. Med. Sci.*, January, 1870, p. 87; also *Lancet*, 1870, 1, p. 276).

An aged man, while at the theatre with his family, rested his forehead upon his hands, which were crossed in front of him, while with his elbows he leaned on the front of the box. It was thought that he had gone to sleep in this attitude, and he was not disturbed; but after the performance was over, and the persons were about to leave the theatre, it was found that he was quite dead ("Ann. d'Hyg.," 1832, 1, 602). A lady who had retired to her bedroom in perfect health was found dead the following morning. She was kneeling at a chair in the attitude of prayer, and her body had become rigid in this position. The editor has seen a similar case. This was also a case of sudden death from apoplexy. In some instances in which chloroform vapour has caused accidental death, the hand firmly grasping the handkerchief has been found applied to the mouth and nostrils, as if the deceased were still breathing the vapour.

These are quite sufficient for general illustration, and they tend to suggest the following deductions :—

1. That instantaneous stiffening is *cæteris paribus* more likely to exhibit itself when great muscular exertion has been made previous to death.

2. That it is also more likely to appear in strong and muscular subjects, whether they are or are not exerting themselves powerfully at the time of death.

3. That *sudden* death is a predisposing factor.

4. That death due to violent disturbance of the nervous system (apoplexy, shot through the head, etc.) is also a powerful element in causation. This mode of death has been experimentally shown to be very capable of producing instantaneous rigidity, or cadaveric spasm.

5. Drowning and other forms of asphyxial death, and also cold, have similar predisposing tendencies towards cadaveric spasm.

6. Considering the uncertainty whether it will appear or not, and considering the peculiarities of the state when it does appear, it is quite evident that for a murderer to imitate the condition by artificial means (bandages, manual pressure, etc.) is almost, if not quite, impossible, provided that critical observations are made by one well skilled in reading the evidence of position.

We may now proceed to insert some of the cases collected and commented upon by the author of this work.

In one case of suicide by a pistol-shot, Devergie found on entering the apartment the right arm and hand of the deceased turned towards the side of the head, against which the pistol had been fired. A man, who had died from the effects of carbonic acid gas given out by a limekiln, was found with the left arm raised and supporting his head, the right semiflexed on the abdomen, the whole figure being that of a person quietly asleep. These facts deserve to be borne in mind, for questions relating to them arise unexpectedly on trials for murder. Although apparently trivial, they may in some instances become the turning-points of the guilt or innocence of a person charged with murder.

In the case of Lord William Russell, who was murdered by Courvoisier in 1840, it was observed that one hand of the deceased firmly grasped the sheet of the bed, as if in a struggle against an assassin. This position of the hand of deceased furnished, among other circumstances, some evidence against the presumption of suicide.

In general, when the dead bodies of the recently drowned are taken from water, the limbs are found relaxed; but this depends on the time at which they are removed. Rigidity of the muscles takes place after death in water perhaps more rapidly than in air. If the water is intensely cold, and the person has struggled violently, the last struggles of life may be indicated by the contorted state of the limbs persisting through rigidity. In February, 1847, a young man while skating

fell through the ice of a pond about seven yards deep. He was not totally immersed, for he kept his head and shoulders out of the water above the ice, with his arms resting upon it; and as the ice gave way under his weight he sprang to a fresh portion. Before assistance could be rendered he sank. The body was recovered the next day; it was found at the bottom of the pond, beneath the hole in the ice. The arms of the deceased were stiff, and still retained the position in which he had rested upon the ice; his legs were quite extended, and the muscles on the fore part of the thigh were very much contracted, as if they had been powerfully exerted in keeping him erect while he was hanging on the ice. There was no appearance of his having attempted to breathe after he had gone below the water. His countenance was quite natural, and there was no water or froth in his mouth; the external appearances resembled those which are seen in a body immersed after death from some other cause. There was no internal inspection.

This case is of interest in reference to the fact of the bodies of persons who have been drowned at the same time by a common accident being frequently found clasped in each other's arms. A contracted state of the muscles at the time of death may pass into perfect rigidity by the effect of cold water; and thus the attitude or the last act of life of the individual may be preserved.

In drowning, it is by no means unusual to find, when the dead bodies are taken from water soon after the accident, that pieces of rope, an oar, grass similar to that growing on the banks, or weeds like those growing at the bottom of a canal or river, are firmly grasped in the hands. This is one of the strongest proofs which we have that the individual has gone into the water living (*vide* "Drowning"). Part of a dress may be thus found grasped in the hand, and serve to identify a person accused of murder.

In the case of *The Queen* v. *George* (Hereford Lent Ass., 1847), a woman was indicted for the murder of her infant child by drowning it. When taken from the water (in the month of December), about nine days after the supposed murder, there were no marks of external violence. The arms and legs were contracted, and the hands closed. On inspection the vessels of the brain were found congested, the lungs were collapsed, and there was farinaceous food in the stomach, partially digested.

The state of the windpipe and the presence or absence of mucous froth are not referred to. It will be seen from this description that there was no appearance to indicate death from drowning with any certainty; and the medical witness admitted that but for the discovery of the body in water a suspicion of death from drowning would not have been entertained. From the state of the brain, death might have been caused by convulsions. The defence was that the child had probably died of convulsions, and that, in order to dispose of the body, the prisoner had stripped it of its clothes and thrown it into the water after death. The medical evidence failed to show that the child had died from drowning, and the prisoner was acquitted. The rigid and contracted state of the child's limbs appears to have created a difficulty in the defence. The clothes of the child were neither cut nor torn, and the witness considered that had the limbs been so contracted as they were when the body was found, these could not have been removed without cutting or tearing. The medical question therefore was, whether the state of the child's limbs did not prove that it had been put into the water while living. As the usual appearances of death from asphyxia were entirely wanting, it is proper to consider whether there may not be some explanation of the facts consistently with

death before immersion. The admission made by the witness in cross-examination appears to supply all that is necessary for this explanation. If the child had died of convulsions, if the clothes were then removed, and the body thrown in immediately, the sudden effect of the cold water might have occasioned the contraction of the limbs; or the child may not have been really, but only apparently, dead when the mother stripped it and placed it in the water. If some time had elapsed before immersion, so that the body had become cold, then the limbs would have been found either relaxed, or stiffened in a straight position. The persistence of this contracted state for so many days may be explained by the immersion having taken place at the coldest season of the year.

The dead body may be found with some article grasped in the hand. It may be the hair of the deceased or the prisoner's hair torn off in the struggle for life; and on this point an important question of identity may be easily raised (*Reg.* v. *Ellison*, Bodmin Sum. Ass., 1845).

In a case which was tried some years since, a man was charged with the murder of a woman with whom he cohabited. The body of the deceased was found lying dead in the house, with such injuries about the head, as to render it certain that she must have been murdered. In her right hand was found a considerable quantity of brown hair, and in the other hand some grey hair, grasped evidently in the struggle for life. On the morning following the murder the prisoner went to a hairdresser's in the town, and desired to have his hair and whiskers cut. This man observed that the hair and whiskers had been recently cut, and evidently by some one unaccustomed to hair-cutting. There was a difference between the hair of the whiskers and that of the head, the former having turned grey. The hairdresser was of opinion that the hair found in the hands of the deceased was of the same colour and kind as the hair of the prisoner. This, with other corroborating circumstances, led to his conviction.

Great light is often thrown upon a question of suicide or murder by attention being paid to these minute points connected with a dead body. As has been above stated a weapon may be found grasped in the hand of a person who has destroyed himself; and when a weapon is thus found, the fact is strongly confirmatory of suicide. It does not seem possible that a murderer could simulate this condition after destroying the deceased. The hand of a dead person, while still warm and pliant, could not be made to grasp a weapon in the same way as that hand which had firmly held it by powerful muscular contraction at the last moment of life. At any rate the attempt to produce this appearance has signally failed. At the trial of a man named Saville, in 1844, it came out in evidence that the deceased, his wife, was found dead with her throat severely cut, and there was a razor, not grasped, but lying loosely in her hand. There was no blood upon the hand which held the razor, and this, together with the fact of its being loose, rendered it probable that the weapon had been placed there by some person after the throat of the deceased had been cut.

The case of the woman Gardner (*Reg.* v. *Gardner*, C.C.C., October, 1862) was marked by a similar incident. The woman had died from several wounds in the throat which could not have been self-inflicted, and a common table-knife was found loosely lying in her right hand, with the back of the blade towards the palm of the hand, and the weapon in the direction of the length of the body. According to the evidence of the medical witnesses, the principal wound in the throat was of such a nature that it could not have been inflicted with the right hand.

This at once proved that there had been murderous interference. On these occasions it may be suggested that a weapon, although grasped by an alleged suicide to inflict the death-wound, may either drop from the hand or be found loosely in it, as a result of the relaxation of the muscles in death. This must be admitted; hence the mere fact of a weapon being found loose should not be taken as evidence of murder, unless other circumstances—such as the nature of the wound, the freedom of the hand from blood, the position of the body, etc.—concur to prove that the act was not one of suicide. Küssmaul asserts that the fact of a weapon, whether a razor, knife, or pistol, being found firmly grasped, should not be taken as any proof of suicide, because, if this position be given to the fingers when in the stage of relaxation, they will in that of rigidity embrace the article so closely that it will be difficult to disengage it. He gives this as a mere surmise, and not as being based on any experiment. In order that it should present itself as a serious objection in practice, we must infer that assassins are fully aware of the forensic necessity of causing the hand of the victim to grasp the weapon with the greatest firmness, and that they can remain by the corpse thus holding the hand clenched until the fingers have stiffened with sufficient firmness to retain it. Assuming this improbable state of things, other circumstances, as in Gardner's case, may show that the weapon after all has been placed in the wrong hand, or that the blood-marks on it and on the hand have no correspondence. The difficulty of thus endeavouring to imitate an act of suicide, when the facts are properly observed and compared, will be apparent from the following case (*Reg.* v. *Heywood*, Liverpool Ass., 1855). The deceased in this case, a female, was found dead in bed with her throat cut. The medical evidence showed that the wound was six inches from right to left, extending across the throat to a point under the left ear; the upper portion of the windpipe was severed, and the jugular vein as well as the muscular branches of the carotid artery were divided. The medical witnesses considered that the wound in the throat had not been inflicted by herself. It was such a wound as a *left*-handed person would have inflicted, and the hand inflicting it, as well as the weapon, could not have escaped being marked with blood. It appears that when the body was found there was a razor in the *right* hand, not tightly held. The arms were folded across the chest, the right hand resting on the left, the back of the razor being towards the person of deceased. There was *no blood on the hands*, arms, or chest, and only one small spot on the razor. There was blood on the underside of a pillow, and a corresponding stain on the bolster, showing that this must have been turned over, and the head placed on the clean side after the infliction of the wound. All the circumstances concurred in showing that an attempt had been made to simulate an act of suicide, while the facts were only consistent with homicide. The prisoner was connected with the act by the moral as well as circumstantial evidence, and he was convicted and executed. Neither during nor after the cessation of rigidity could this spasmodic condition of the muscles of the hand be simulated; in no case is it possible to give an appearance of grasping similar to that which is occasionally found after death as a result of cadaveric spasm and rigidity.

The discovery of a weapon thus held in a dead hand has been wrongly assumed to furnish evidence of murder.

In 1835, a medical man at Bordeaux was called to examine the body of a gentleman supposed to have been murdered. Upon entering the apartment, which had been left undisturbed, he found the deceased perfectly dead, sitting in an arm-chair by the side of the bed, the left elbow resting upon a bolster. His right hand, which held a recently discharged pistol, rested upon the middle of the right thigh, the greater part of the barrel projecting over the inner surface of the thigh, so that the slightest motion of the part would apparently have been sufficient to cause it to fall on the floor. The bullet, which could not be found, had fractured and traversed the left parietal bone, after having torn off nearly the whole of the face. The clothes of the deceased were saturated with blood; a large quantity had also drained through the seat of the chair, and had formed a considerable clot on the floor. The temperature of the body indicated that the deceased had not been dead above two hours, and it was at about that time that the discharge of a pistol had been heard by some of the neighbours. The other facts ascertained relative to the case were that the deceased, who was about sixty years of age, had never shown any disposition to destroy himself; and there was no moral circumstance which seemed likely to have acted as an exciting cause, except perhaps the loss of a lawsuit by a favourite sister, which, however, was deemed scarcely sufficient to explain the event. He had a son, who lived in the house with him, and slept in the same room. They were both dissipated in their habits. On the morning of the event, after breakfast, the son, according to his own statement, threw himself on his bed, which was by the side of that of his father; he fell asleep, and knew nothing of the circumstance until he was aroused out of his sleep by the discharge of a pistol. The son was accused of having destroyed his father, and of having placed the pistol in the hand of his parent after death, in order to lead to the supposition of suicide.

The circumstance seemed so much the more probable to the police officers and those who were present at the finding of the body since when the hand with the pistol was carefully carried to the position in which the weapon must have been held by the deceased in order to have committed the fatal act himself, and the hand was afterwards allowed to fall by its own weight, the pistol each time fell from the hand to the floor. Besides, on the moral side of the question it was shown that the son would be benefited by the death of the father.

The medical examiner having duly reflected on the position in which the deceased was discovered, satisfactorily accounted for the hand retaining the pistol after death by the contractile state of the muscles from the effect of volition at the moment of death being sufficiently strong to prevent the weapon from falling. The experiments performed with the hand and pistol subsequently were very properly stated to be unsatisfactory, since, when this contracted state of the muscles has been once destroyed by much handling, it cannot be restored. The specious argument thus founded upon a popular error was, by the tact of the medical witness, satisfactorily refuted. The reporter of the case candidly confesses that, owing to his having been misled by popular prejudice, he was at first almost inclined to believe that the son had been guilty of parricide; and probably if a hasty and careless examination had been made, or if the body had been officiously interfered with previously to its being seen by a medical man, the son might have been committed for trial on a charge of murder. So soon as this apparently physical proof of his guilt had been explained away, it was then seen that all the other circumstances rebutted the presumption of homicide. The discovery of a weapon so held may be considered as one of the best possible proofs of suicide.

10. Putrefaction.

This is the final stage or sign of death. By it we understand the chemical changes which are produced in all organic matter by the influence of living micro-organisms. One of the very earliest experiments performed at the time when these minute creatures were commencing to be studied was a very simple and very conclusive one. It was as follows: organic fluids derived from animal bodies, and even the solid tissues, were first rendered aseptic: *i.e.*, they were exposed to such processes, chiefly the repeated applications of heat, as would effectually kill all micro-organisms in them; they were then placed in an atmosphere equally aseptic, and the entrance to this atmosphere of any micro-organisms was rendered rigidly impossible. It was then found that the substance so treated had no inherent tendency to decompose—there are certain scientific exceptions to this rule, exceptions in which light alone has power to alter chemical combinations, but they are of no interest in our present connection—but would remain fresh for an indefinite time. With the limitations mentioned, this experiment has never been proved to be fallacious, and it is now universally admitted that micro-organisms are alone sufficient to account for putrefaction in a medico-legal sense. In bodies openly exposed to the air, water, and soil, etc., of course, other animals, ants, beetles, flies, rats, fish, etc., etc., assist in the process of causing a body to disappear, but this is another matter, and we must repeat, in order to emphasise the statement, that under ordinary circumstances micro-organisms alone are responsible for decomposition occurring in a human body.

During the course of the last fifteen or twenty years an enormous amount of work has been done in attempts to study the physiology, or response to environment, of these micro-organisms. The work has, of course, been chiefly in the domain and interests of clinical medicine, but incidentally we have learnt a good deal about the microbes of decomposition, of which the following is a brief epitome, but quite sufficient for medico-legal purposes; the whole subject will be found fully described in any good modern text-book on bacteriology.

It has been found—

(*a*) That a microbe to which the name *Proteus vulgaris* has been given is the commonest agent in the decomposition of animal remains. In Sternberg's "Text-book of Bacteriology," to which the reader is referred, *Bacterium cadaveris* and *B. gaudis*, *Proteus mirabilis* and *P. Zenker*, are also stated to be important agents in putrefaction.

(*b*) That numerous other microbes belonging to the distinctly pathogenic, the quasi- or potential pathogenic, and the purely saprophytic genera, also take a share in, at any rate, the early stages in the process.

(*c*) In the *B. M. J.*, vol. 2, 1897, pp. 1853 and 1854, will be found an abstract of the fauna of dead bodies by Garry de N. Hough. It is too technical to insert here, and of no material assistance to the medical jurist.

(*d*) These microbes depend upon their environment for activity. Thus some require oxygen (aerobic): some can do without oxygen (anaerobic); some, it might be said all, require a certain degree of moisture, but the degree of moisture at which they can do their best

work varies with the genus; some can work best at or about the temperature of the living body: others are equally or more active at what may be called the average temperature of the air. Extremes of temperature either kill outright (the temperature of boiling water or higher), or inhibit the activity (temperatures approximating to the freezing point of water or lower), of all microbes.

(*e*) These microbes, both essential and accessory, exist in countless millions in the intestines and skin of every human being, and possibly also even in other tissues and organs of the body, and within a very short time of death may be found universally distributed throughout all organs and tissues, especially including the blood.

(*f*) They also exist in incalculable numbers in the soil of the earth's surface. This statement must be modified by saying that they are most numerous in the upper foot or eighteen inches. Below this they diminish rapidly in numbers, and none can be found below, from three to four feet, from the actual surface of the ground except such as lie in contact with the deep roots of trees, etc.

(*g*) It is probable that they form, in the tissues they are feeding on, bodies of the nature of ferments which can for a limited time continue to decompose the tissues even when their producers die or lose their vitality. Several such ferments have been isolated.

From these scientific or theoretical considerations we are able in some degree to understand some of the phenomena of decomposition under ordinary circumstances; but the action of the environment, the inherent potentialities of the microbes, and the state of their vitality at any moment involve such an enormous number of varying and variable factors that it becomes quite impossible to explain on a rational basis of ascertained fact—intangible theories and suppositions are readily enough to hand—the extraordinary variations in the circumstances of putrefaction that have been observed. How, for instance, can the following be explained?

Cases of Unusually Delayed Putrefaction.—In a few remarkable cases of an authentic character the process of putrefaction has been considerably retarded, and coldness and rigidity have not manifested themselves in the ordinary course. Such cases of apparent death would necessarily give rise to doubt. The phenomena observed were probably owing to the presence of some traces of molecular life persisting in the body after active life had entirely ceased. One of the most singular of these cases was reported in Hufeland's *Journal of Practical Medicine*:—

A young man who was a patient in the hospital of Paderborn, in Prussia, died, as it was supposed, under symptoms of phthisis, but not of a well-marked character. He had recently recovered from an attack of ague. The cause of death appears to have been obscure, and after, as it was believed, he had expired, his eyes were suddenly opened, and the physicians thought they detected for some minutes an irregular beating of the pulse. Some wounds and cauterisations were made on the body without arousing him, and on the third and fourth days these, it is said, had passed into a state of suppuration. On the fifth day his right hand turned back and closed; from the fifth to the ninth day a clammy perspiration was perceived upon the skin; and some vesicles containing serum were formed on the skin of the back. During this time there was no appearance of respiration or circulation, and the limbs, although cold, were pliant and flexible. The forehead was furrowed with vertical wrinkles, and the countenance had an expression not usually observed in a dead body. On the eighteenth day the lips presented their

usual red colour, and although the body was lying during this time in a warm room, there was no disagreeable odour and no cadaveric ecchymosis. On the twentieth day the signs of putrefaction first became apparent, leaving then no doubt of the reality of death.

As a report of this case was published in a medical journal of repute, although the details are imperfectly given, it may possibly be considered authentic. As such the conclusion to which it leads has already been anticipated. The ordinary signs of death—*i.e.*, slow cooling and progressive rigidity—were not observed. Further, when the body was exposed to conditions favourable to putrefaction, the changes indicative of this process are stated not to have been manifested for a period of twenty days. Such a case was altogether exceptional, and was thus treated by the hospital officials. The body was neither inspected nor buried, but simply watched until death was made certain by the actual occurrence of putrefaction. Had this patient fallen into the hands of ignorant nurses or attendants instead of professional men, it is probable that the body might have been consigned to the grave in two or three days. Although, as the event subsequently proved, this would not have furnished another instance of the premature interment of a living person, yet the proper course in all doubtful cases is to wait until that doubt has been satisfactorily resolved by the appearance of the obvious signs of decomposition.

A case of a somewhat similar nature occurred at Deptford in 1844. A youth died suddenly, and, in consequence of the body showing no signs of decomposition after several days, it was believed by the friends that the deceased was in a trance. The body was seen by several medical men, and they, in spite of some unusual phenomena, came to the conclusion that the youth was really dead. Some days after death the features acquired a natural character, and there was no change indicative of commencing putrefaction. The body retained its general appearance for twenty-eight days; but several medical men who saw it at this period agreed that decomposition had begun. It was not until thirty-five days after death that the friends would allow an inspection to be made, and it was then found that deceased had died from an attack of congestive apoplexy.

It was observed at the inspection that, in spite of the long period which had elapsed since death and the exposure of the body to a warm temperature, putrefaction had made but little progress. In October, 1849, a youth died at Bristol from an attack of malignant cholera in about fourteen hours. After the lapse of forty-eight hours it is stated that the warmth of the body was perceptibly retained, and there was no appearance of decomposition. Some days afterwards, however, the process manifested itself as usual. *Vide* also case of Desha (p. 334), and the cases quoted under "Cooling of the Body" (p. 250).

The process of decomposition, as commonly observed, is marked by two striking phenomena. These are (*a*) changes of colour; (*b*) the production of gases.

We may now pass on to describe the process as it usually occurs and then consider many interesting and important points in the connection.

To facilitate reference, a table is here inserted of the order of discussion:—

1. Colour changes, external and internal.
2. The gases of decomposition.

3. The effects of these gases.
4. Circumstances influencing the onset and progress of decomposition.
5. Observed facts in the order of decomposition of the internal organs.
6. Differences between bodies exposed to the air and those that have lain in water.

1. Colour Changes.

Externally these consist in the appearance of a yellowish green, or bright green, or coppery red discoloration of the skin. The point where this commences and the direction in which it spreads differ somewhat according to whether the body has been exposed to the air or has remained in water (*vide* below); the rate at which it spreads and the rate of decomposition in general vary very materially according to circumstances which will be considered later. Soon after the colour change has begun the veins of the skin, particularly on the limbs and neck, become marked as dark purplish red or blue lines due to decomposition of blood in them and a soaking of their coats by this blood (the blood becomes strongly alkaline with ammoniacal products and effervesces on the addition of an acid). They then form very prominent objects to the eye on a background of lighter red, purple, green, or black skin.

Internally much the same change of colour is observable in the various viscera—liver, spleen, kidney—though shades of dark red, varying to black, are commoner tints than green. The bile also soaks through from the gall bladder and tinges the tissues in contact with, or near, it a yellow, or greenish, or dark colour, which resembles in some respects that of decomposition. With this colour change the viscera become softer and greasy to the touch; they eventually seem, as it were, to melt into a more or less continuous stinking mass, so that the individual organs can no longer be separately removed.

2. Gases of Decomposition.

The following is a table of the gases formed, according to Tidy, but their (frequently) very offensive nature would indicate that others may be present:—

Early.	Later.	Latest.
SH_2	CH_4	NH_3
CH_4	CO_2	N
NH_3		CO_2
PH_3		
CO_2		

Lewis examined and reported on the external condition and appearance of 22,000 coffins accumulated in the vaults of London churches. He examined the state of the contents of about one hundred of these. The experiments were made on the bodies of persons of all ages, and on coffins which had been deposited from a short period to upwards of a century. He did not find therein sulphuretted, phosphoretted, or carburetted hydrogen, or any compound of cyanogen. The gases which he uniformly detected in the coffins and the vaults

were nitrogen, carbonic acid, and atmospheric air, holding putrescent animal matter in suspension. Ammonia was occasionally found in large quantities; this when present overcame all other odours. When absent the animal matter had a smell resembling that of putrid moist cheese. He opened one leaden coffin in which the corpse had been enclosed for nearly a century; the ammoniacal gas which escaped from it formed dense white fumes when brought into contact with hydrochloric acid gas. It was so powerful that the head could not remain near it for more than a few seconds at a time (*Amer. Jour. Med. Sci.*, January, 1852, p. 275). The same results were noticed in reference to a body which was exhumed after six months' interment. When the coffin lid was removed by the side of the grave a large quantity of fœtid ammonia escaped. On throwing into the coffin some chlorinated lime, dense white clouds of chloride of ammonium were evolved from the interior of the coffin, to the great alarm of some of the bystanders, who were not aware of the chemical changes produced. It would appear that the air enclosed in coffins is in general completely deoxidised. When tested it was not inflammable, but was found in every instance to extinguish flame. In leaden coffins putrefaction is so much retarded that the remains of bodies were found in them after the lapse of a century. The metal is slowly corroded and changed into white lead.

The chemical composition of these gases is of little medico-legal importance, but the points that are of importance are (1) that they do form (beneath the skin, in hollow viscera, and, eventually, in solid ones too) under considerable pressure; and (2) produce effects that are of the highest importance.

3. Effects of Pressure of the Gases of Decomposition.

1. **Blood Displacements.**—We have already drawn attention to the fact that after death the arteries, by virtue of their power to contract, and their elasticity, being much greater than that of the veins, empty themselves into the veins, and may thus cause a post-mortem hæmorrhage from a wounded surface (vein or capillaries). We have here to mention the more special effects of decomposition which cause,—

(*a*) *Post-mortem bleeding* at a later date than that mentioned above. —This form does not offer so much difficulty in deciding whether the wound was ante or post mortem, because the resultant outpouring of blood will show no trace of coagulation at all; it will have simply soaked into the surroundings like so much inorganic coloured fluid.

(*b*) *Shifting of a Hypostasis.*—Owing to the pressure of the gas developed in the blood of a hypostasis, this may be displaced in any direction. Thus Snow was once called to see a young woman after she had been dead three days, whose face had suddenly become so suffused and red, that her friends doubted the reality of her death. After a time, however, the colour abated, and obvious putrefaction clearly proved that she was dead (*Med. Critic*, January, 1863, p. 26). The author has witnessed a similar appearance in a corpse; the cheeks acquired a florid red colour between the third and fourth day after death, when rigidity had ceased. It is supposed that this colour is due to the action of the oxygen of the air on the blood forced into the capillaries

by incipient decomposition. It is hardly necessary to observe that this appearance, coupled, as it is stated to have been in some cases, with a slight degree of warmth, could not give rise to any mistake about the date of death, since the rest of the body would be cold, and in death which is really recent the face becomes cold before the skin of the chest and abdomen.

The importance of the fact lies in this, that when once putrefaction has commenced in a dead body the inferences as to the position in which the corpse has lain since death will be materially weakened, so far as they rely upon the position of hypostases for their support.

(*c*) *Fluid Effusions into Cavities.*—The pressure on the overloaded capillaries continues to increase as the gases of putrefaction are developed. This constant pressure forces the serum (brownish red in colour, offensive in odour, uncoagulable, and tinged with blood) into the serous cavities, more especially into the pleuræ and pericardium. The fluid thus effused after death may be recognised by its being homogeneous, whilst that effused during life as the result of inflammation is usually non-homogeneous, and frequently contains pus and false membranes. These after-death effusions are said not to be found in cavities lined with mucous membranes (Orfila and Devergie). With respect to the time of their formation, they rarely occur for some weeks, but never during the first week, after death.

(*d*) *Emptying of the Heart and Lungs.*—When putrefaction has commenced, and there is no open wound from which blood can escape, the cavities of the heart may suffer compression from the gases generating within the chest and abdomen, and a portion of the blood may be thus forced out of them. If full at the time of death, and the body is examined within a week, it is not probable that the cavities would be completely emptied. If the heart is found empty, and at the same time contracted, its emptiness cannot be assigned to the effects of putrefaction; it was most probably the natural condition of the organ shortly after death. A collapsed and empty condition of the lungs has been ascribed to pressure from the gases of putrefaction, the assumption being that they had contained air and blood at the time of death. This is not in accordance with observation. In advanced putrefaction these organs have also contained gaseous matter and dark-coloured liquid blood. In examining putrefied bodies in cases in which death has been alleged to have been caused by some form of asphyxia—*i.e.*, strangulation or suffocation—it will be important to bear in mind these conditions of the heart and lungs. The organs may be found empty and collapsed; in such a case, it must not be too readily assumed, in order to reconcile this condition with the foregone conclusion of a violent cause of death, that they were full of blood or congested at the time of death, and that their emptiness is owing to post-mortem changes. It may be equally probable that they were empty when the person died, for emptiness of the heart and a collapsed state of the lungs are frequently found in bodies which are not putrefied. Hence the medical opinion in a given case can be only an inference or surmise. Orfila has observed blood in the cavities of the heart as well as in the lungs of exhumed bodies which had been for some time buried, the organs having a bluish slate colour ("Médecine

Légale," 4th ed., 1, 642). This subject has elsewhere been referred to (*vide* "Asphyxia").

2. **The Gases blow up the Features.**—We have already mentioned how death alone alters the features ("Identity") so as to make recognition less easy. With the onset of putrefaction the features are so blown up, swollen, and altered in colour, that identification becomes absolutely impossible. Indeed, the likeness to a human being is sometimes difficult to realise, when lips, nose, eyelids, and cheeks are distended into a simple green sphere. The mere fact of the impossibility of recognition, however, sinks into insignificance beside the results of the other effect of this blowing up the features; thus the eyes may be forced forward almost from their sockets, and the tongue become blackened and forced forward against the teeth or even protruded between them, and thus a picture of violent death from strangulation (*q.v.*) may be closely imitated. It is impossible to lay down any rules of general application to differentiate the two. The facts only emphasise the caution which must be used in deciding that death was due to strangulation when a body is found very advanced in decomposition (*vide* "Strangulation").

3. **They force Frothy Mucus and even the Contents of Stomach into and from the Mouth.**—The importance of this fact lies in the erroneous inferences which again may be drawn as to the cause of death when such froth or material is found running from the mouth. Thus froth about the mouth is commonly assumed to point to death from drowning or from poisoning. The editor has no hesitation in speaking most positively that even in bodies which are quite fresh such an inference is absolutely untrustworthy, as he has seen both froth and stomach contents issuing from the mouth in persons dead from all sorts of diseases such as occur in a large general hospital. This statement must be contrasted with that of finding such substances below the larynx, in trachea or bronchi, from which very reliable inferences may be drawn (*vide* "Drowning," "Suffocation," etc.).

4. **They may force a Fœtus from the Uterus.**—A case of this kind is reported in the Guy's Hosp. Rep., 1864, p. 253. The editor has been able to find two more recent cases. Thus (*B. M. J.*, 1895, vol. 1, p. 663) :—

Mr. Evan Jones, surgeon to the Aberdare Cottage Hospital, sends us the following particulars of a case which was briefly reported by him at the meeting of the South Wales and Monmouthshire branch of the British Medical Association on February 28th :—"The case referred to is that of M. M., aged thirty-seven, whom I saw in consultation with Dr. Thomas, of Hirwain. She was eight months gone in pregnancy. When seen she appeared *in articulo*; she had general dropsy, and was violently convulsed. The os was unusually rigid. I managed to dilate so as to admit an index finger. During manipulation her condition got so critical that we thought it advisable to delay dilatation. Dr. Thomas saw her four or five hours before death, and the os was then in the same condition. He saw her again five hours after death, and the child was *in utero*. He then assisted the midwife to lift her on to the bed. Two days afterwards the undertaker, putting the body in the coffin, found the child and placenta between her legs, with fluid running freely from the vagina."

The second one is reported by Dr. Albert Green, of Chesterfield, as follows :—

"On October 27th, 1894, I performed a post-mortem on a young unmarried woman fifty-three hours after death. On looking at the body I found, between the

thighs, a full time child, with the uterus inverted and protruding from the vagina. The placenta was attached to the uterus, and the umbilical cord uncut. The women (two) who laid her out immediately after death found no signs whatever of birth of a child, and no appearance about the perineum nor vulva of such being imminent; they saw nothing unusual nor unnatural. They washed the body, and tied the feet togother in the usual way. She had had pains (probably labour pains) previous to death, so probably labour had commenced ante mortem. At the time of my examination the abdomen was enormously distended with gases; the body was very fat; the face was black and swollen, the front of the chest and abdomen green, so that putrefaction had evidently well set in; the perineum was considerably ruptured. There were no other marks of injury neither in uterus nor vagina. I think myself the cause of death was puerperal convulsions, or possibly some form of poison suicidally administered." Dr. Green comments on the case very pertinently as follows:—"The chief points of interest were—

"(1) The birth of a full-time child some hours after death.

"(2) Inversion of the uterus with attached placenta.

"(3) The well-marked laceration of the perineum.

"Previous to hearing the evidence of the women who laid out the body I took it for granted that the child had been born during the life of the mother, for I examined the laceration of the perineum carefully, and quite believed from its appearance that it had occurred during life: the torn surfaces looked reddish and vascular. It is true no blood was found on the clothes of the deceased nor on the bed. I made a cut close by in order to note any differences, and found the surfaces of this latter cut to look quite white and bloodless in comparison. The edges of the original laceration were in a more advanced state of decomposition than the surrounding tissues. Putrefaction was very advanced, the liver was almost diffluent, and the mucous membrane of the stomach was raised by gas bubbles."

After careful perusal of the evidence, the editor would draw attention to the fact that it leaves the question of whether the uterus, by its contraction alone, expelled the fœtus, being itself inverted by the gas, or whether it was the gas that expelled the fœtus and inverted the uterus, but it establishes beyond doubt *post-mortem* extrusion of a fœtus, a point which might be of importance.

In previous editions Dr. Taylor thus delivered himself on the subject:—"Several instances of post-mortem delivery have been recorded (*Med. Press*, October 9th, 1872), and they have all arisen from the same cause: the extrusion of the fœtus from the relaxed uterus as a result of the accumulation of the gases of putrefaction. Post-mortem parturition formerly gave rise to many superstitious notions, but the facts connected with this condition are now fully understood. (See *Lancet*, 1872, 1, p. 596.) If the body is not in a decomposed state, it is unusual to find the uterus retaining the power of expelling the fœtus by its own muscular contractions after the death of the woman. It is obvious that in certain cases this condition might be used to cover and conceal a case of criminal abortion. The subject was brought before the Medico-legal Society of Paris by Pénard ("Ann. d'Hyg.," 1873, 1, 213). He was required to report on an alleged case of delivery thirty-six hours after the death of the woman, in which the question of expulsion by gaseous putrefaction could not arise. A young woman died under suspicious circumstances after eight days' illness. It was only just before her death that the medical man in attendance discovered that she was pregnant, and had probably reached the fifth month. He made no examination after death, and when the body was laid out there was no unusual appearance. When raised to be placed in a coffin, thirty-six hours after death, a fœtus fell from between the legs of the

corpse. On examining the body, the uterus was found with the placenta attached, inverted, and extended from the outlet. Pénard, after fully considering the case as submitted to him, came to the conclusion that after the death of the woman the uterus would not retain the power of expelling the fœtus and inverting itself by spontaneous muscular contraction. No doubt there are great difficulties in admitting that a spontaneous action of the uterus after the death of the woman should be so powerful as not merely to expel the fœtus and placenta, but actually to invert or cause prolapsus of the organ; still the occurrenee of such cases rests upon good authority ("Obst. Trans.," 1873, p. 255). In these rare instances it is probable that the women had reached the full term, and parturition might have commenced before death. In the case related by Pénard, the woman had only reached the fifth month, and at this stage of pregnancy it is improbable that the post-mortem contractions of the uterus, without any assignable cause, would have operated to expel the child and invert the organ. It is more reasonable to suppose that in this case there had been criminal interference (*Lancet*, 1872, 1, pp. 517, 596; 2, p. 119). The subject of post-mortem parturition was brought before the Obstetric Society ("Obst. Trans.," 1873, p. 240), and Aveling has here reported thirty cases of this kind. The principal conclusions at which he arrived were (*a*), that the uterus may expel its contents after death even in cases in which no symptoms of natural parturition can be discovered before death. He also (*b*) considered that expulsion of the placenta, spontaneous evolution of the fœtus, and prolapsus, inversion, and rupture of the uterus, may equally take place post mortem. He referred these effects either to a eontracting power remaining in the womb after the death of the rest of the body, or to the pressure exerted on the uterus by the gases of putrefaction, the latter being the more frequent cause. His cases also led him to a conclusion having an important bearing on the medico-legal relations of this subject: (*c*) that after the death of the woman a child may continue to live in the uterus for many hours [not now aecepted.—Ed.], but when a woman dies undelivered no time should be lost in removing the fœtus" (*op. cit.*, p. 255).

5. **They will cause Floating of a Body (with Alternate Sinking) in Water.**—The specific gravity of the whole body is only a little above that of water. Consequently, apart from other mechanical considerations, a dead body will sink until sufficient gas develops to make its specific gravity less than that of water; it then rises, and the gas probably escapes; it sinks again, and again develops gas: and so the game of rising and sinking may proceed.

4. Circumstances influencing the Onset and Progress of Putrefaction.

We have already briefly laid down the canons of microbic life as observed in the laboratory; we have now to consider the ordinary influenees as they exist on the earth and harmonise their effects with experimental results. As a matter of ordinary observation, it is found that the time after death at which putrefaction eommences may vary

from a few hours to many days, weeks, years, or centuries, and experience has taught that the principal factors are—

1. Temperature of the air to which the body is exposed;
2. The presence of moisture;
3. Influence of access of air;
4. Influence of light;
5. Influence of the state of the body;
6. Influence of the nature of the death;
7. Influence of chemical substances;
8. Influence of burial in earth;

and in this order they will be dealt with.

1. **Effects of Temperature of the Air.**—The process is found to go on most favourably in a temperature varying from 70° to 100° F. It will commence, other circumstances concurring, at any temperature above 50° F.; but at 32° F. it appears to be wholly arrested. The dead body may thus be preserved a considerable time in snow, ice, or in frozen soil; but if after removal it is exposed to a temperature between 70° and 100° F., the ordinary putrefactive changes are stated to take place with more than their usual rapidity. Erman states that the body of Prince Menchikof, one of the favourites of Peter I., was exhumed at Beresov, in 1821, after a burial of ninety-two years in the frozen soil of Siberia. Although so long a time had elapsed, the body had undergone but little change. The heart and some other parts, with a portion of the grave-clothes, were removed and sent to the descendants of the deceased ("Travels in Siberia," vol. 1, p. 462). But a still more remarkable instance of the preservative or antiseptic power of cold is exhibited in the discovery of the body of an ancient elephant (*Elephas primigenius*), the race of which was extinct before the historical period, in a mass of ice at the mouth of the river Lena, in Siberia, in 1805 (*Quart. Jour. of Sci.*, vol. 8, p. 95).

At a high temperature, again—*i.e.*, about 212° F.—putrefaction is arrested. The effect of temperature on this process is strikingly seen in the influence of season. A dead body exposed to air during summer, when the thermometer is above 60° or 70° F., may undergo more marked putrefactive changes in twenty-four hours than a similar body exposed for a week or ten days in winter. This is a fact which demands consideration when an opinion is required to be formed respecting the date of death of a body concerning which nothing is known. This influence of temperature is strikingly in accord with what we know of bacterial life. We shall have to recur to the matter in discussing inferences (*vide infra*).

2. **Influence of Moisture.**—Unless the animal substance is impregnated with water or moisture, it is impossible that putrefaction can take place. The animal solids commonly contain sufficient water for the spontaneous establishment of the process. In a human body weighing 150 lbs. there are about 100 lbs. of water. The soft organs differ much from each other in regard to the quantity of liquid contained in them, and therefore in the degree in which they are prone to putrefaction. Thus the brain and the eye are in this respect contrasted with the teeth, bones, hair, and nails. The fluids of the eye are rapidly decomposed, while the teeth and hair may remain for centuries unchanged. Quekett examined a portion of dried human skin with hair upon it

which had been exposed for many centuries on a door of Worcester Cathedral, and also other portions taken from the church doors of Hadstock and Copford, in Essex. He found upon them some hairs which were proved by the microscope to be human, thus confirming the old tradition that the skins of persons who had committed sacrilege were nailed to the doors of the churches which they had robbed (*Edin. Month. Jour.*, July, 1848, p. 63).

If the organic substance is deprived of its water, putrefaction is arrested. Gay-Lussac found that flesh might be preserved for a considerable period simply by suspending it under a bell-glass placed in a dish of fused chloride of calcium. Albumen and gelatin, deprived of water or dried by chloride of calcium, have been kept in a dry state for a period of twenty years, during which time they have been exposed to air and a favourable temperature without undergoing putrefaction. An excess of water, however, tends to retard and modify the process; thus, by allowing a current of water to fall on animal matter, it may be preserved for a long time. Water in excess seems to retard putrefaction by merely cutting off the access of air. By long contact it produces an alteration in the soft solids, converting them into a white substance. The differences in decomposition in a body exposed to water and to air will be further referred to (*vide* below).

3. **Influence of Access of Air.**—There are three separate points to be remembered here: (*a*) that the air which gains access to a corpse is not under ordinary circumstances aseptic, but contains variable numbers of microbes; (*b*) the physical qualities of the air as regards motion and moisture; (*c*) the chemical constitution of atmosphere which surrounds a body.

(*a*) *Septicity of Air.*—Under this head we only require to note that free access of air at ordinary altitudes and in towns simply means that the supply of microbes to carry on the work of decomposition is inexhaustible, and as soon as one group has died out, finished its work, or failed to accomplish anything, other groups, possibly of different genera, can arrive to produce an effect. It has been found that the higher the altitude of mountains the fewer the microbes in the air, which, with the lowered temperature, will easily account for bodies remaining fresh on the tops of mountains for long periods. It must be admitted, however, that, generally speaking, there are already in the body at death a sufficient number and variety of microbe to carry the process very far, provided that temperature and moisture are favourable (*vide* "Influence of Disease" below).

(*b*) *Physical Qualities of Air.*—Air, apart from its temperature (*q.v.*), influences decomposition according to whether it is dry or moist, at rest or in motion. Dry air thus retards decomposition by desiccating the tissues exposed to it, and if the dry air be in motion the effect is still more marked. It is thus that natural mummification (*q.v.*, *infra*) takes place. *Per contra*, moist air provides a condition which is favourable to the microbes of decomposition, and the effect is again enhanced if the moist air be warm and still. These effects are remarkably well illustrated in the case of Byrne (pp. 335 *et seq.*).

(*c*) *Chemical Constitution.*—We are here face to face with the whole complex problem of aerobic and anaerobic microbes and the chemical

constitution of the air in which microbes can work. It seems to be well established that aerobic microbes require oxygen, without oxygen they die, and seem to be incapable of splitting up even simple chemical combinations. For this reason carbonic acid and nitric oxide —especially the latter, since it at once combines with free oxygen— act as most powerful antiseptics. In a series of experiments on the properties of these gases in retarding putrefaction the author found in one that a large piece of fresh muscle was preserved effectually in a bell-glass of nitric oxide over water for eighteen weeks; in a second experiment, for nineteen weeks; in a third, for a period of thirty-two weeks, or 224 days; and in a fourth, for a period of seventeen months. The last experiment was commenced in October, and after eighteen months the muscle suspended in the gas retained its red colour, and had undergone no change indicative of putrefaction. These experiments were carried on under all variations of temperature in a room not below 40° in the winter season, but which sometimes reached 80° F. in summer. As the vessel containing the gas was placed over water, the gas was, of course, always saturated with aqueous vapour. Two of the conditions for putrefaction were therefore present. Oxygen only was removed. In some parallel experiments in air and oxygen putrefaction had gone on to a full extent in eight or ten days. These facts show that oxygen, in a free state, is eminently necessary for the destruction of the soft parts of the body by putrefaction so far as this is done by aerobic microbes.

It may be safely stated that none of the ordinary gases of putrefaction act like the above gases under ordinary circumstances.

As to the atmospheres in which anaerobic microbes can act, but little is really known, though many gaseous chemical products such as chlorine, SO_2, etc., etc., are well known to be fatal to all microbic life, possibly by direct action on the microbes themselves, and hence have a reputation as antiseptics. That anaerobic microbes can, however, carry decomposition on to its extreme end is proved by the fact that they are used in one process of sewage disposal, which has proved successful so far as complete destruction of the sewage is concerned.

It must be admitted that for some reason these anaerobic microbes frequently cease their action when bodies are hermetically sealed in lead coffins, for such are often found very little decomposed, even after long periods.

4. **The Influence of Light.**—This has not hitherto been found to have any practical influence on the commencement or progress of decomposition, but as many anaerobic microbes work better in the dark, it is possible that light may have some unsuspected influence, though probably only of a theoretical nature.

5. **Influence of the State of the Body.**—Fat and flabby bodies are observed to undergo putrefaction more readily than those which are thin and emaciated. Connected with the state of the body, we may also mention the influence which wounds or bruises, or mutilations of any kind, have over this process. Those parts which at the time of death are affected by contused or incised wounds, ecchymosis, or extravasation, rapidly pass into a state of putrefaction. Thus, in examining bodies which have been subjected to violence during life, contusions and ecchymoses may appear greatly aggravated in extent,

unless the examiner be aware that such parts become more speedily decomposed (*vide* below, "Cause of Death").

Children are said to decompose as a rule more readily than adults. The bodies of chronic alcoholics undoubtedly have a tendency to rapid putrefaction, though alcohol, *in vitro*, has slight antiseptic power. This fact is a little difficult of explanation, unless it be that the fatty degeneration so commonly observed in such subjects is the explanation.

6. **Influence of the Cause of Death.**—*Acute Diseases.*—The bodies of persons who have died from acute diseases have been observed to putrefy more readily than those of persons who have died from wasting and chronic disease. In the numerous examinations of the dead made at Guy's Hospital by Wilks he observed, as a rule, that the bodies of those who had been long ill, and were emaciated, remained unchanged for a longer time than those who had died from acute disease (Guy's Hosp. Rep., 1863). It would appear as if some diseases had either directly or indirectly a retarding influence over the process. It has been also remarked that the bodies of plethoric persons who have died suddenly while in good health have undergone rapid decomposition. In persons who have died from asphyxia, as by drowning, suffocation, or strangulation, the bodies are, *cæteris paribus*, observed to putrefy with great rapidity; and, as a general rule, all those parts of the body which at the time of death are irritated, congested, or inflamed, are rapidly attacked by the putrefactive process.

Septic Diseases.—These constitute really a class of the above acute diseases, but there can be no doubt that they show in a very special degree this tendency to rapid decomposition. The explanation may lie in the fact that the pathogenic microbes which cause death are capable of carrying on decomposition after death; this seems very probable on general consideration of such diseases during life, or it may lie in the fact that the changes which the microbes and their toxins produce in living tissues really constitute some of the earlier changes in the decomposition of such tissues, or, more probably, both factors play a large part in decomposition. Bacteriological experiments and investigations in later years have shown that many of the products of bacterial action are of the nature of ferments, and hence, even if the pathogenic organisms themselves die, these ferments may, and probably do, largely assist in putrefaction. The gaseous products of *Micrococcus acrogenes capsulatus* may be specially mentioned in this connection as likely to assist by mechanically disintegrating the tissues and rendering access of air and microbes very easy.

Lightning and Violent Exercise.—These have been already noticed (*ante*, under "Rigor Mortis") as accelerators of the departure of cadaveric rigidity, with which departure decomposition is practically synchronous. They fill the muscles apparently with disintegration products, which are very unstable and liable to decompose.

Death from Poison.—Conflicting statements have been made regarding the process of putrefaction in the bodies of those who have died from certain poisons. Thus it has been stated that in death from prussic acid, morphine, and other vegetable poisons, putrefaction generally commences early and progresses with rapidity; while strychnine has been supposed to exercise a retarding power. In poisoning by vegetable narcotico-irritants the blood is observed to be

frequently dark-coloured and very liquid, and it may therefore have undergone some chemical change which may render it more prone to decomposition. But the observations elsewhere made will at once account for the conflicting statements, and show that putrefaction may be accelerated or retarded under the influence of the same poison, according to the modes in which it operates on the muscular system at the time of death. Thus when strychnine destroys life rapidly, without exhausting the muscular irritability by frequent convulsive fits, putrefaction takes place slowly; but if muscular irritability is destroyed before death, it speedily supervenes, and runs through its stages rapidly. As a general rule, putrefaction is not set up in a body so long as cadaveric rigidity remains in the muscles. When this condition comes on late, and lasts for a long time, it is slow in appearing, whatever may be the nature of the poison; under opposite conditions putrefaction takes place rapidly, provided the circumstances are favourable. In a death from nicotine, in which all muscular irritability appeared to be destroyed, putrefaction commenced early, and in a few hours had made great progress. The body was bloated, and the skin tense and much discoloured. [Probably this had no connection with the nicotine.—Ed.]

Some poisons, by chemically combining with animal matter, appear to confer on it the power of resisting putrefaction, at least to a very great degree. This is now a well-known property of arsenic, and in the arts this poison is largely employed as an antiseptic. When a solution of it is injected into the arteries of a dead body, it tends to preserve it for a long time from putrefaction. In examining the bodies of persons poisoned by arsenic after an interment of six, twelve, or twenty-four months, we have found the stomach and bowels remarkably preserved, and the liver, spleen, and heart also preserved, but in a less perfect manner. The preservative effects are occasionally such that we have seen the pathological changes in the mucous membrane well marked after the body had been nearly two years in the grave. At the same time, it must be admitted that this preservative property is not manifested in all cases; hence we must not fall into the error of affirming that the person has not died from the effects of arsenic because the viscera are much putrefied. The greater part of the poison may have been expelled before death, or only a small dose may have been given to the deceased. These facts respecting the action of arsenic are now so well known to lawyers and medical men that they are seldom disputed. Nevertheless, in a trial for murder (Lewes Sum. Ass., 1849, *Reg.* v. *Geering*), an attempt was made to refer the non-occurrence of putrefaction, in a case of poisoning by arsenic, to another cause. The deceased, Richard Geering, died on September 13th, 1848, and his body was exhumed April 27th, 1849, after an interment of rather more than seven months. When the coffin was opened, the face and upper parts of the body were much decomposed. The viscera were in a remarkable state of preservation. The substance of the heart was quite firm. Arsenic was found in well-marked quantity in all these parts. In the defence, a village undertaker was called to prove that, in burying the body, he had placed a slab of wood immediately above the coffin in order to keep the earth from it. An attempt was thus made to account for the preservation of the body irrespective of the action of arsenic. But this hypothesis was

inadmissible. A slab of wood could scarcely affect the ordinary course of putrefaction in a grave; and if it did, it would influence it in all parts equally. In this instance those parts of the body only were preserved in which arsenic was found; the abdominal viscera, which are commonly the first to undergo putrefaction in its ordinary course, were here less changed than the other organs of the body (*Med. Gaz.*, vol. 45, p. 19). Chloride of zinc, a powerful irritant poison, is another well-known preservative. It retards putrefaction apparently by combining with the tissues. In the case of Ann Palmer (*Reg.* v. *Palmer*, 1856), whose body was exhumed after twelve months' burial, all the organs were found preserved; they contained antimony, which had penetrated even to the ovaries and the substance of the uterus. In the case of Harriet Lane (1875), her murderer, Wainwright, attempted to destroy the body by the use of chlorinated lime; but this substance acted as an antiseptic, and therefore as a preservative.

7. **Influence of Chemical Substances.**—It has been alleged that there are certain chemical substances which have the property of accelerating the process of putrefaction; and among these *lime* has been particularly mentioned. The mineral acids and alkalies, in a concentrated state, act powerfully upon structures of the body; but they destroy it by immediately corroding it, and not by producing any changes in it analogous to putrefaction. Persons who have been guilty of murder have endeavoured, but ineffectually, to destroy the dead human body rapidly, sometimes by attempting to burn it, and at other times by the use of nitric acid, lime, or chlorinated lime. The attempt has generally failed. Dr. Webster endeavoured to dispose of the dead body of Dr. Parkman by employing various chemical reagents, but without effect. In the case of the Mannings (*Reg.* v. *Manning and Wife*, C.C.C., October, 1849), it came out in evidence that the body of the deceased O'Connor was buried in a hole beneath the stone floor of a kitchen. The two prisoners, in order to destroy the body, poured over it a pint and a half of vitriol, and then covered it with fresh-burnt lime, which was slaked upon it under the idea that this would rapidly destroy it; but the body was disinterred, and all the facts necessary to show that the deceased had been murdered were clearly brought out. At the trial it was stated by one of the medical witnesses that lime would certainly cause a dead body to decompose more rapidly, that the features would be thereby much disfigured, and the brain reduced to a fluid state. This theory was set up in order to account for the apparently rapid putrefaction of the body compared with the time that deceased had been missing; but this was sufficiently accounted for without resorting to this hypothesis, by the season of the year (August) and the superficial interment. The medical opinion here given regarding the effect of lime was in accordance with a popular view which appears to be incorrect. Some years previously to the trial of the Mannings the dead body of a child, placed in a box and covered with lime, was brought to the author for examination in reference to a charge of infanticide. Considering the period of death and the season of the year, the body was in a better state of preservation than might have been expected. The abdomen and lower extremities, which had been completely covered with powdered lime, were very well preserved. There was nothing to show that the lime had exercised any accelerating

influenee. On the contrary, it had probably retarded putrefaetion by keeping off air. A stiff eream of lime has no corrosive or caustic action on the skin or muscles ; its chief use in the tanning of skins is not to corrode them, but to combine with and remove the fatty portions. Comparative experiments were performed with powdered lime partially slaked by exposure on portions of raw flesh. The flesh acquired a greenish colour on the outside, but was speedily dried by the action of the lime, and after five weeks it was found that putrefaction had become arrested, and the flesh was harder and firmer than a similar portion which had been exposed to air during the same period (*Med. Gaz.*, 1850, p. 20). John Davy, from the results of his experiments, has arrived at a similar conclusion. With the exception of cuticle, hair, and nail, which were softened by the action of wet lime, he found that this alkaline earth did not exercise any destructive or corrosive power on animal substances generally, nor had it any effect in promoting their decomposition. On the contrary, in the dry state it exerted a preservative and decidedly antiseptic power, arresting putrefaction even after it had commenced (*Med. Gaz.*, January, 1850).

It will be seen at once that all these substances are now well recognised as antiseptics, with great powers of destroying microbes when used in sufficient strength. The results add another strong link in the chain of proving that putrefaction is entirely the work of microbes, and that destruction of tissues by desiccation and the like belongs to another category of changes in organic bodies, totally distinct from putrefaction.

8. **Influence of Burial in Earth.**—In the scientific data (*supra*) regulating putrefaction will be found facts which go a long way in explaining the variations which are found in buried bodies. Apart from these data, the editor has nothing to add to the author's original exposition of the subject, which is reproduced praetically intact.

Exhumations are occasionally required for the purposes of justice, and it is under these circumstances that opportunities may occur for observing the progress of putrefaction in the dead. Unfortunately the results of these observations have hitherto led to no satisfactory conclusions, for sometimes one body has been found more decomposed after six or eight months' burial than another which has lain interred for a period of eighteen months or two years.

From facts hitherto collected, especially from the researches made by Orfila, it would appear that the changes which take place are similar to those described in speaking of putrefaction in air. There is in the first instance a discoloration of the skin of the abdomen, owing to decomposition taking place more readily in the contents of the viscera. The skin of the whole body becomes green, and the epidermis loose and easily detached by pressure or friction. The muscles also acquire a dark green colour, become more or less pulpy, and in the course of time lose their fibrous character. The lungs are distended with gases, and completely fill the cavity of the chest. The heart and liver are softened, and acquire a dark slate colour. The same change is observed in the spleen and kidneys, the fat around the latter organs being commonly white and firm. The whole of these organs will be found much reduced in size. Thus the liver may weigh no more than a pound or twenty ounces. The surfaces of the soft organs, espeeially of the liver,

frequently present small circular patches of a hard white crystalline substance, which is insoluble in water. It consists chiefly of crystals of phosphate of calcium with organic matter, and in some instances associated with triple phosphate of ammonium and magnesium. The author has found these crystalline deposits in bodies which have been exhumed at periods varying from one to three years after interment. When the process is farther advanced, the soft organs are filled with vesicles of gas, and float on water. The stomach, intestines, and urinary bladder have their mucous surfaces stained with patches of a brown, green, or deep slate colour. Sometimes these stains are of a coaly blackness. The coats of the stomach, if entire, may be closely adherent. They are very thin, difficult to separate, and are frequently ruptured in the attempt to examine them. All the contents may have disappeared with the exception of a thin layer of a black substance, which is probably decomposed blood. The lining membrane is sometimes covered with deposits of small hard crystals of phosphate of calcium, or phosphate of ammonium and magnesium. These must not be mistaken for crystals of white arsenic. The stomach and intestines may be stained of a deep orange or yellow colour with bile. This may be identified by its forming a green-coloured solution when boiled in hydrochloric acid. The marks of irritant poisoning, and those pathological changes in the viscera so characteristic of death from poison, are now lost in the discolorations produced by putrefaction. As the process advances the body becomes covered with fatty incrustations of a reddish brown colour, and the interstices are filled with the common blue, white, or green mould, intermixed with another reddish-coloured fungus. The skin and soft parts become thin, and fall off in places, and expose the bones. The coverings of the chest and abdomen are so collapsed as to be in contact with the anterior portion of the spine. The muscles are considerably reduced in bulk; and they may be found in part converted into adipocere. The viscera are also much shrunk, collapsed, and often, if we except the stomach and duodenum, so intermixed, that it is not possible to identify or separate them. The liver may in this way be found incorporated with the lungs, owing to the destruction of the diaphragm, and the brain completely collapsed. In one exhumation, after four years' burial, the whole of the soft parts of the chest and abdomen formed a soft whitish yellow mass disposed in condensed layers. It was impossible to distinguish the stomach from the liver, intestines, or lungs. The periods of time over which the author has had an opportunity of examining exhumed bodies have varied from one month to eight years. In the case of Peter Mawer, whose remains were exhumed at Boston in 1862, after eight years' burial in a damp grave, the body was in fragments, the soft parts loosely adhering to the bones, immersed in a large quantity of water in the coffin. The muscles, soft organs, and skin were converted into a white sodden mass, in which no organ or part could be identified. The mass had a fibrous structure; it contained oily matter, and had a very offensive odour, like decayed cheese. The bones were of a dark colour; they could be drawn perfectly clean out of the soft parts. The water of the coffin contained phosphate and sulphate of ammonium, with animal matter.

At this period the features are entirely destroyed, and the form of

the skull and skeleton generally is apparent. In a still more advanced stage, scarcely any traces of the soft organs are to be met with. The muscles, if not already changed as above described, pass into the condition of brown foliaceous masses. This is chiefly observed in those bodies which have been buried in a dry gravelly soil. The bones are disarticulated, the long bones giving the perfect outline of the skeleton, while the short and flat bones, including the bodies of the vertebræ with the base of the skull, are converted into a brownish white pulverulent mass, mixed perhaps with the friable remains of the wooden coffin in which the body was buried.

It has been found impossible to assign any definite period of time to these changes, or, from an observation of them, to give any certain opinion respecting the length of time for which a body has been interred. The reason is obvious: bodies undergo these changes with very different degrees of rapidity, even when they have been interred under similar circumstances. In one body buried for a period of nine months, and in another for thirteen months, there were no traces of the coverings of the abdomen to be discovered; in a third, these coverings were found almost entire after a burial of twenty-three months; yet these three bodies had been wrapped in cloth of the same texture, and buried by the side of each other in coffins of the same kind of wood (Orfila). In the removal of the remains of about two thousand bodies from St. Andrew's churchyard for the Holborn Viaduct, some bodies were found well preserved. They were mummified, dry, and like tanned leather. In one case, that of a man, the clothes were quite perfect; in another, that of a lady whose body had been buried considerably over a century, the lace on the grave-clothes was perfect and only slightly changed in colour.

It is commonly said that the soft parts are entirely destroyed in a period of from seven to ten years; but this must depend on the circumstances under which the body is buried, *i.e.* the kind of coffin, the nature of the soil, and the depth of the grave. Devergie states that in one instance he met with no trace of a shroud in a body which had been buried three years and a half, while in another a portion was discovered after seven years' interment. The author had an opportunity of examining a grave in which a body had been buried twenty-five years. Soft fragments of the coffin of a dark brown colour were found, but of the body only the skull (excepting the base) and some portions of the long bones remained. In an adjoining grave, nearly the entire skeleton was discovered lying at full length, surrounded by the decomposed coffin. This was after thirty-four years' burial, and the bones were nearly all perfect. He also found here traces of the shroud on the inside of what had been part of the coffin-plate, and the texture of linen was made evident by submitting it to the microscope. Unless the body has been buried in metal, or converted into adipocere, it is not probable that any of the soft parts will be found, in a soil favourable for decomposition, after ten or twelve years. They may exist as a sort of unctuous fat mixed with the wood and earthy matter, but they are not likely to be in a condition to admit of identification. Perhaps the usual period for the destruction of the soft parts in thin wooden coffins may be taken at about ten years.

In most instances of judicial exhumation the period of interment

is well known, and no opinion is required of a medical witness on this matter. The only case on which he may be called upon to give an opinion is where a skeleton or some bones have been discovered lying loosely in the soil. Great embarrassment might exist in defining the period of interment in an unknown case when a body has been buried in a coffin; but this does not, for obvious reasons, occur in practice. The bodies of those who have died by a violent death are commonly buried superficially in loose ground without a coffin; hence the data obtained by examining the progress of decomposition of bodies placed in coffins, even if they were more precise, could rarely be available for practical purposes. As the teeth, the bones, and the hair are among the most indestructible parts of the body, it will be necessary in an exhumation to look for any portions of these that may remain. They often throw light upon the age and sex of the individual, and serve to determine questions of identity (*vide* "Identity").

The circumstances which modify the progress of putrefaction in the earth may be in some measure anticipated from what has been already said of this process in air. Among them may be enumerated the period during which the body may have been exposed to the atmosphere before interment, the nature of the soil in which it is buried, and the depth of the grave, with other circumstances, the precise influence of which it is difficult to estimate. There are a few special conditions which may affect the decomposition of bodies buried in the earth; and without a knowledge of them a witness may be led to express an erroneous opinion. The most important are—

Date of Interment.—It is well ascertained that a body putrefies much more rapidly in air than in any other medium; hence, if it be kept long exposed before it is interred, putrefaction will take place much more readily, and advance to a much greater extent, than if it had been buried soon after death. If a body be kept exposed during the summer for five or six days, and then interred, it may be found on exhumation, after the lapse of a month, that putrefaction is as far advanced as it would have been after the lapse of several months supposing that the subject had been interred within a few hours after death. Owing to this circumstance, there is a difference in the rapidity of decomposition according to whether the bodies on which the observations have been made were interred after exposure to a hot and moist or cold and dry atmosphere. It has been already stated that the period at which cadaveric rigidity of the muscular system ceases is that at which putrefaction may be considered to commence. Many circumstances have been pointed out which retard or accelerate the access of this condition of the body. When cadaveric rigidity has been retarded by any of the circumstances mentioned, the putrefactive process will necessarily be a longer time in making its appearance; when the rigidity is a speedy consequence of dissolution, we may expect that putrefaction will take place rapidly.

Nature of the Soil in which the Interment takes place.—If the ground is elevated or on an acclivity, it will commonly be dry, and decomposition will be retarded; if a body is buried in a low situation, or in a valley, the soil being generally damp, decomposition will be hastened. A dry and absorbent soil retards putrefaction; and thus bodies buried in the sands of Egypt become often perfectly desiccated, and resist the

process for a long series of years. The chemical nature of the soil also has an influence, which may be briefly stated. In sand, gravel, or chalk, putrefaction goes on more slowly than in other soils, and adipocere is rarely met with, unless there is free access of water, when that portion of the body exposed to the contact of water may become adipocerous. In marl or clay, if air has access, the process takes place more quickly, especially in loose mould or in any porous soil much impregnated with animal or vegetable matter. It is in these last-mentioned soils, provided they are not too dry, that the formation of adipocere is observed; and however great the rapidity with which putrefaction may have advanced previously, it is either suspended or modified on the occurrence of this change. By a reference to the nature of the soil, therefore, we may often explain why a body, after having been interred for a considerable number of years, may be exhumed apparently unaltered by decomposition. The whole of the soft parts may have become converted into this white substance; but although the physical outline may be preserved, the texture of the organs will be completely changed (*vide* "Adipocere").

When a dead body is immersed in a liquid of a preservative nature, as in the water of a peat-bog, the changes which take place are of a peculiar kind, and they render it difficult to arrive at even an approximate conclusion respecting the period of death. A male human skeleton was found near the surface of a peat-moss or bog. All the bones were detached, and were of deep chocolate colour. The right femur had been accidentally fractured obliquely, and the skin and muscles were closely adherent to it. They were free from any unpleasant odour, and were completely tanned. The bones were destitute of phosphate of calcium, and in consequence were as flexible as cartilage. It was calculated by a comparative measurement of a thigh-bone that the stature was five feet seven inches. The sex was determined as usual by the roughness of the bones and the size and shape of the pelvis. There were no means of determining the cause of death. The skull had not been fractured. It was supposed that the person had been shot and the body deposited in the bog ten years previously, but it might have been lying there fifty years. The removal of the phosphate of calcium was a remarkable fact; it probably depended on the action of the water. Tannin was, no doubt, the agent by which the soft parts were preserved.

Depth of the Grave.—Observation shows that the deeper the grave the longer putrefaction is retarded. This may depend upon several circumstances, as the want of a free access of air in deep graves and the uniformly low temperature which is known to prevail, at all seasons of the year, at a certain depth below the surface of the soil. Bodies buried in shallow graves are subject to the fluctuations of temperature which take place during the day and night, and throughout the seasons of the year; they are therefore most favourably placed for the rapid progress of putrefaction. According to the most accurate observations, the diurnal changes of temperature extend to about three feet in depth below the surface, while the monthly changes are perceptible to the depth of six feet. Bodies buried below this depth putrefy slowly, *cæteris paribus*, owing to the uniform and comparatively low temperature which is there maintained. As in these cases there is no free

access of oxygen, ammonia and sulphuretted hydrogen are abundant products of decomposition. There is also a comparative absence of fresh bands of microbes to continue to work, and those which can gain access have their powers much diminished by the low temperature in which they have to work. The exposed parts of the skin are soft, completely brown, like the skin of a mulatto, and the limbs, as well as the face, are thickly covered with a soft white fungus. Such has been the condition of bodies of which the author has witnessed the exhumation after an interment of from one to two years.

The State in which the Body is buried.—Putrefaction is more rapid in bodies buried naked than in those which have been buried wrapped in clothes. This point may be a subject requiring especial attention in investigations relative to infanticide, since the bodies of children are often thrown naked into a pit, and loosely covered with earth. The process is less rapid when the body is interred in a close coffin; and when the latter is formed of an imperishable material, such as lead closely sealed, putrefaction is speedily arrested; and the deceased may be recognised after the lapse of many years. The reason why bodies are better preserved under these circumstances is obviously owing to the access of air being cut off. Any confined mass of air, so soon as the whole of the oxygen contained within it is removed by combination, acts antiseptically, forming an atmosphere of nitrogen which retards putrefaction, and thus the body may be preserved for a long period. Again, too, we see the influence of the readiness or the reverse with which microbes can gain access to the body from the soil.

5. Observed Facts in the Order of Decomposition of the Internal Organs.

There can be no doubt that some organs are, generally speaking, more resistant to putrefaction than others. No absolute reliance can be placed on such data, but the order in which they commonly putrefy may occasionally be of some little assistance in helping to determine the date of death, and it is therefore worth while to insert the following table for reference:—

Organs which putrefy early approximately in the order given.

Larynx and trachea bright red or greenish in three to five days.	The larynx is an actually open tube, kept so by its cartilages, and hence allows an easy entrance to microbe-laden air.
Brain of infants soft and pulpy in four or five days or less.	The scalp is very thin, and the bones of the calvarium are not very close together nor fixed. It is probable also that the organic material is so complex that a little decomposition makes a great show.

Organs which putrefy early, &c. (contd.).

Stomach and intestines show signs in five or six days.	These even during life contain an enormous number of microbes which can at least initiate decomposition. The cæcum is probably the best circumstanced as regards warmth and degree of moisture, etc., and hence the green patch over it is a very early sign in its appearance.
Spleen soon becomes soft and dark.	Probably from nature of its blood-contents (microbic, rich in toxins and unstable extractives).
Liver soon superficially discoloured, but remains firm for some weeks.	Is a solid organ of stable enough constitution? (Comparable to too great concentration for microbes to act.)
Brain of adults, firmish for a week or two.	Better established in its constituents than the infantile, and also rather better protected. Miss Holland's brain was still recognisable four years after burial in four feet of earth.

Organs which decompose later, again approximately in order.

Heart quite distinguishable for months.	This doubtless varies, as in deaths from septic diseases the editor has found it very soft even in forty-eight hours.
Lungs. Often very early may be seen gas bubbles between pleura and lung, but no further decomposition even for months; then they turn green and black.	Probably associated with the demonstrated fact that the air in the ultimate alveoli is aseptic, except, of course, in disease.
Kidneys and bladder.	May also be partly explained by the fact that healthy urine is aseptic. In the case of Miss Hickman and also of Miss Holland the kidneys had resisted putrefaction longer even than the uterus.
Œsophagus.	A closed tube without access of air and swept clean by swallowing.
Pancreas.	A solid organ (*vide* "Liver").
Diaphragm.	Muscles decay rather slowly in general, possibly owing to their solidity, but *vide* "Death by Lightning and Exhaustion," etc.
Bloodvessels.	Probably owing to the resisting power of elastic tissue, which is practically extra-vascular.

Organs which decompose later, &c. (contd.).

Uterus has been found distinguishable in a body that had lain in a cesspool for nine months. Casper was able to report on this case that she was not pregnant at the time of her death.

This, too, I think, must depend upon circumstances of death; after puerperal fever, I have found it rapidly decomposing.

It is worth while also to draw attention to the differences which are apparent in the order of external signs of decomposition between bodies which have remained in the air and those which have been in water.

6. The Differences observed between Bodies left on Land and those found in the Water.

The order of the superficial appearance of the colours of decomposition is said to be different.

Water.	In order of appearance from above down.	*Air.*
Face and neck, or sternum.		Abdomen.
Shoulders.		Chest.
Arms.		Face.
Abdomen.		Legs.
Legs.		Shoulders.
		Arms.

The explanation of this is not very apparent. We can understand that the face, which usually floats out of water, should go first because of the access of air and the right condition of moisture, but the subsequent direction in which the decomposition goes is certainly inexplicable on any simple plan.

Casper goes so far as to state that the order in which the various parts exhibit colour-changes affords strong evidence either in favour of or against death by drowning; but Dr. Tidy remarks, "I have reason to believe that this inverse order of putrefaction in water and in air occurs equally whether the body be submerged alive or dead. I agree with Ogston, moreover, in his statement that occasionally (although rarely) the colour-changes in submerged bodies commence on the abdomen."

The process undoubtedly takes place more slowly than in the atmosphere, owing to the low temperature and the free access of air being cut off. The skin covering the palms of the hands and the soles of the feet is found thickened, white, and sodden from imbibition when the body has remained several days in water. Owing to this cause, ecchymoses resulting from violence during life are not always apparent in a body at the moment it is removed from water; it is only when the skin has lost the greater part of the water by evaporation that ecchymoses and other marks of violence begin to show themselves. The influence of air upon the skin of a body which has been for some days submerged is chiefly seen, after its removal from water, in the face and chest. In a few hours, if the temperature of the atmosphere be moderately high, the face will commonly be found bloated, and either livid or black. The features are so distorted, that they cannot be recognised by those who knew the person during life; the change chiefly consists in the skin becoming first of a livid brown

colour, and afterwards passing to a deep green. The discolorations are chiefly apparent in those parts which are freely exposed to the atmosphere. They are not commonly found on surfaces which have been in close contact, as in the armpits and upper and lower limbs, where the former have been closely applied to the sides of the body, and the latter have remained in close proximity to each other. For the same reason the discolorations are not commonly met with at the back of the body, or on those parts which have been closely wrapped in clothes.

Gaseous putrefaction takes place in bodies immersed in water, as well as in those which are exposed to air. The abdomen, chest, and cellular membrane beneath the skin are thereby distended; the body acquires buoyancy and rises to the surface. It requires but a very slight expansion of the cavity of the abdomen for this effect to follow, since the human body is only slightly heavier than its bulk of water. The position in which a dead man's body floats is commonly with the abdomen or back on the surface, and the head with the upper and lower extremities depending. The bodies of females, it is said, are more commonly found floating with the abdomen upwards. The period of time required for a body to rise to the surface, from gaseous putrefaction, must depend on many circumstances. It is stated to happen usually from the third to the fifth day after death from submersion (eighth or ninth day in deep sea-water.—Ed.). The gases may be then liberated, and the body will sink; they may be again generated, and it will rise. The facts connected with the buoyancy of the dead body became of great importance in the trial of Spencer Cowper (1699) for the alleged murder of a woman (see "Drowning"). If the dead body has been submerged for some weeks or months, or has remained long exposed before inspection, the skin will be found of a deep blue, black, or green colour, the muscles soft and discoloured, or the fatty parts may have been converted into adipocere. Ultimately the soft parts will be washed from the bones, and the skeleton separated.

The changes from putrefaction in the drowned or apparently drowned, even when comparatively slight, may, as Casper justly remarks, seriously affect the value of medical evidence. The blood becomes decomposed, acquires a darker colour, and produces congestions in the brain, lungs, right side of the heart, and other parts of the body, so as to render it difficult to form a conclusion on death from apoplexy or asphyxia.

The researches on drowning made by Casper and Kanzler show that, while the lower part of the body may be in a tolerably fresh condition, the face, head, neck, and upper part of the chest may present a reddish colour passing into patches of a bluish green, first seen on the temples, ears, and nape of the neck, thence spreading to the face, and afterwards to the throat and chest. These changes may be observed in summer when a body has remained in water from eight to twelve days, and in winter for a still longer period. The head of a drowned person is sometimes much discoloured from putrefaction when the rest of the body is in its ordinary condition.

Attempts have been made by the aid of baths of chlorine, salt, and hydrochloric acid, as well as by injections of chlorine, chloride of zinc, and ferric chloride, so to restore the features of a drowned body as to enable persons to identify it (*Lancet*, 1863, 1, p. 551). After the

occurrence of such changes from putrefaction in the drowned as those above described, it would be hopeless to attempt to restore the expression of the features of the living man. It is one thing to arrest or prevent putrefaction by these agents, but another to suppose that the chemical changes can be reversed, and the corpse put in the position of a body recently drowned. It may be well to state in this place that great mistakes have been frequently made by persons relying upon the features as proof of identity in the drowned.

A singular case of this kind came before Wood, V.-C., in March, 1866 (*Holliss* v. *Turner*). The plaintiffs instituted this suit in order to establish the death of one William Turner. This person was of restless, unsettled habits, wandering about the country, and in a state of great mental and bodily depression. On May 7th, 1865, he walked into the house of some people named Waller at Guildford. He was shivering with ague, covered with boils and sores, and had a fortnight's unshaven beard. His sores were dressed with rags. On the following day he left the place, and was never again seen alive. Ten days after his disappearance the body of a man much decomposed was found in the river Wey, near Guildford. An inquest was held on it the same day, but it was claimed by two men, named Etherington, as the body of their father, who was missing. Mrs. Waller and others saw the body, and stated their conviction that it was the body of Turner. The body, however, was buried as that of Philip Etherington, a ragged piece of neckerchief having been previously removed from the neck. Some months afterwards Etherington, sen., the supposed deceased, walked into his daughter's house. It was therefore clear that the sons must have been deceived as to the identity of their father. There was no doubt that this was the body of Turner. A fragment of an old neckerchief, found under the bed where this man slept on May 7th, corresponded exactly with that which was removed from the neck; and further it was remembered that there were sores on the body, which had been dressed. The Vice-Chancellor held that the evidence adduced was sufficient to identify the body found in the river Wey as that of Turner, and made an order accordingly.

The case of Miss Hickman created so much interest, and is so apropos of decompositions, that the editor inserts the account of her inquest in full as taken from the *B. M. J.*, 2, 1903, p. 1105:—

An inquest was held at the Police Court, Richmond, on Wednesday, October 21st, by Dr. Taylor, J.P., the district coroner, on the body found in Richmond Park, which was alleged to be that of Miss Hickman, whose mysterious disappearance for nearly two months has excited great interest. [She disappeared on August 15th.—Ed.]

A maid employed at the house of Miss Hickman's father in Courtfield Gardens identified the clothes produced by the marks thereon as having belonged to Miss Hickman. She also identified a watch and chain and two bronze medals, one granted by the St. John Ambulance Brigade for proficiency in "first aid," upon which the name of "Fanny Hickman" was engraved, and the other a medal won by her young mistress in a swimming competition.

Several little boys, of ages varying from nine to twelve, deposed that on October 18th they had been hunting for chestnuts in a game-preserved part of the park, and that whilst searching in the heavy undergrowth they had suddenly come upon the body of a woman; that, struck with fright, they ran away home and only related what they had seen during the afternoon; and that they had difficulty in getting their parents to believe them and report the matter to the police.

Inspector Cleeve and several sergeants of police detailed the steps they took upon receiving the information that a body had been seen in a plantation in the park, and how late at night they instituted a search party, and after much difficulty traced the whereabouts of the body in consequence of the smell. They also related the result of a further search of the ground when daylight appeared, at which time they were able to find the various articles described by the maid, and also an empty medicine bottle, unlabelled and uncorked. They also stated that it would have been impossible for less than four people to have lifted the body over the fence surrounding the plantation, and explained that even as it was it required several constables to remove the body when found. They also negatived the idea of foul play.

Dr. Gardiner, living at Richmond, deposed that he was a registered medical practitioner and police-surgeon of the division.

Examination before Removal.—Dr. Gardiner said: "On Sunday, October 18th, about 10.30 p.m., I was summoned by the police to view the body of a woman that had been lying in one of the plantations in Richmond Park. The police required me to see it previous to removal. I went to the plantation and saw the body. The body was lying on the ground as near as I could guess about eight yards from the iron fence which surrounded the plantation, and was covered by the leaves and boughs of rhododendrons. The body was lying on the left side and slightly prone, the head pointing towards the direction of Richmond Hill. The left arm was fully extended at right angles to the body palm up; the right arm was across the chest and tucked in below the left breast; the thighs were flexed slightly upon the abdomen, the legs flexed upon the thighs. The left leg was drawn up more than the right, and the right ankle was in the hollow of the left foot. The body was clothed, and the clothes were in no way disarranged. The head was separated from the body, and lay about five or six inches away and slightly behind the middle line; it was turned up as if looking over the right shoulder. The head and face were denuded of all soft parts with the exception of a little integument on the occipital bone. The lower jaw was detached and lying a little in front of the middle line of the body, partly covered by leaves and partly by a large straw hat, which was lying upon and among leaves, crown up. The lower jaw was devoid of tissue, and several teeth were lying beside it, having dropped from the jaw. The neck appeared to be gone, but in the line of the neck, and close to the body, I found the second cervical vertebra. The hands and feet appeared to be gnawed. Such examination as I could then make showed no signs of violence. The body was lying under boughs and on none. No boughs appeared to be broken beneath the body. The position of the body was as if the deceased had lain down to sleep or rest. The bushes formed a thick screen above and around. The body appeared well nourished, and that of a large and powerfully built woman. There was a pad of hair lying on the ground between the skull and the lower jawbone."

Post-mortem Examination.—Continuing, Dr. Gardiner said: "I made an examination later at the mortuary. I performed the post-mortem examination, assisted by Dr. Saward and in the presence of Mr. Pepper. The body was well nourished; no parts of the body exhibited marks of violence such as fractures of bone, bullet wounds, or cuts. The body was much decomposed; the skin in many places was absent, being apparently gnawed away. The head was entirely detached, the cervical vertebræ all detached with the exception of the seventh; all the other cervical vertebræ were missing with the exception of the second. The skull was denuded of all soft parts, and exhibited no fractures and no wounds, bullet or other. The face was long and oval; the upper and lower jaws when placed in position were opposed; many of the teeth in both jaws had dropped out; some were stopped with gold, and others with amalgam. The brain had gone. The hair was coarse and brown in colour, tied up behind with tape and fixed with ordinary hairpins, and was about seventeen inches in length. The skin had been gnawed away in front of the chest to the bottom of the breast bone. The skin and soft tissues of the neck and shoulders were completely gone; the clavicles and first ribs were exposed. On the left side the soft tissues of hand and wrist were gnawed away, as also the skin of the lower half of back of the forearm. The fingers were missing, except part of the middle finger, and of this only the metacarpal bone was left. The skin of the right arm was gnawed away in the lower third of the dorsal aspect, and from the lower two-thirds of the palmar aspect of the forearm. All the fingers were missing. The skin and muscular tissue of the right lower limb were gnawed away, also the upper third of the leg, also the front and outer side of the ankle opening into the joint. The toenails were detached; that of the great toe was *in situ;* nearly all the epidermis of the sole was gone. The skin of the left lower limb had been gnawed away on the lower half of the leg; the skin of both legs was marked by the ribs of the stockings; the knees exhibited longitudinal ribbing due to the underclothing. The epidermis of the left sole was peeled forwards and stained black. The skin on the outer side of the abdomen and right hip was mottled green, less so on the left. A portion of the breast was left. The uterus was present, and was virgin. The liver, spleen, and right kidney were entirely gone, as also the greater part of the intestines. The stomach was just discernible, the only contents a reddish brown layer adherent to the walls, but it was impossible to ligature it. The left kidney was fairly well preserved in its

capsule; the cortex and medulla could be recognised. A small part of the small intestine was healthy. The heart muscle and chordæ tendineæ could just be recognised; the lungs were shrunken, and formed a pultaceous mass; the tongue, pharynx, larynx, and œsophagus were all gone, also the trachea. The teeth found were all natural, one or two stopped with gold and two built up with an amalgam made of oxyphosphate; no false tooth was found. The bones found were digital phalanges, cervical vertebræ, and the hyoid bone. The knife found was a common scalpel, had no maker's name upon it, and was not similar to those which were possessed by Miss Hickman. There was rust upon the knife, partly old and partly new."

Conclusion.—"My conclusion after careful examination is that Miss Hickman has been dead for about two months. I am of opinion that there is no evidence that death was due to external violence or to starvation. I am of opinion that Miss Hickman entered the plantation alive, and lay down in the spot where she was found. I cannot give the cause of death, as the result of both examination and dissection is entirely negative. I have preserved the left kidney and portion of the small intestine left, and hold these for analysis should it be decided to examine these chemically. The height of the body, making all allowances, would be about five feet nine inches. The missing vertebræ may be lying deep down in the soil or have been carried away by animals. The greatest agency in the detachment of the head was decomposition, the rest due to the gnawing away of parts by animals. I have no doubt about this; it was not due to violence."

Mr. Pepper, M.S., F.R.C.S., Lecturer on Medical Jurisprudence at St. Mary's Hospital, corroborated all the evidence given by Dr. Gardiner. He mentioned that on the inside of the medicine bottle produced was a greenish deposit, freely movable, but he could not without analysis state what it was, nor could he add to the medical evidence already given.

Dr. Saward, who had assisted at the necropsy, also confirmed the evidence.

The Coroner decided to adjourn the inquest for two weeks to enable the police and others to finish their inquiries; but before closing the court desired the jury to express their opinion as to the identity of the body, in order that he might issue order for burial.

The jury unanimously decided that the body which they had seen that day, and upon which the inquest was held, was that of Sophia Frances Hickman, M.D.

For Sir Thos. Stevenson's evidence and analysis in the case, *vide* "Morphine Poisoning."

11. Formation of Adipocere.

The formation of adipocere and mummification form the two last changes that bodies undergo after death that need to be described; they belong to a rather different category to putrefaction proper, and indeed form the antithesis of it, but as bodies thus converted do ultimately disappear, they strictly are stages in the disappearance, if not of the putrefaction, of a body.

The substance called *adipocere* was first observed and described by Fourcroy during the removal of vast numbers of bodies from the Cimetière des Innocens in Paris. He gave to it this name, owing to its properties being intermediate between those of wax and fat. He considered it to be constituted of fatty matter and ammonia. From an analysis by Chevreul, the substance described by Fourcroy was proved to be a real ammoniacal soap with some extraneous colouring matter, which gave it a yellowish or brown colour. It contained, besides, an undefined bitter substance, and an odoriferous principle, to which it owed its smell. Chevreul also detected in some specimens compounds of calcium, potassium, and other metals. The composition of adipocere does not appear to be uniform; it is liable to vary according to the

nature of the medium to which the body has been exposed. Thus, in hard or river water, the white substance so called, discovered in the dead body, is formed with a calcium base; so, in bodies laid in graves or vaults which are traversed by springs of water containing sulphate or carbonate of calcium, an adipocere of stearate and oleate of calcium is found as a hard white solid. It is not improbable, as Orfila has suggested, that in the first instance an ammoniacal soap is produced, and that this is subsequently converted into a calcareous soap by contact with calcareous water. Indeed, Orfila states that he experimentally established this point by macerating ammoniacal soap in a solution of sulphate of calcium. In three weeks he found that a calcareous had been substituted for the ammoniacal base.

Properties of Adipocere.—Fourcroy and other chemists have described adipocere as an unctuous, soapy substance, varying in colour from a pale white to various shades of yellow or brown. In the first instance it is soft, but becomes harder and lighter in colour when dried. It melts at 200° F., and when strongly heated in air gives off an ammoniacal odour, takes fire, and burns. It is easily suspended in cold water, and forms an opaque mixture on boiling. Acids decompose the solution by combining with the bases, forming salts. When heated with lime, ammonia is evolved. It is only partly dissolved by boiling alcohol. Adipocere with a calcareous is harder and whiter than that with an ammoniacal base. There is no trace of organised structure in either.

The author having had an opportunity of examining this substance as it is found in bodies after long interment in damp graves, a description of its properties is here subjoined. A man named Peter Mawer died and was buried at Boston in October, 1854, and his body was exhumed for judicial purposes in June, 1862. The condition in which it was found after an interment of eight years has been already described. The white substance into which all the organs had been completely transformed was unctuous to the touch, and had a peculiar and highly offensive odour. When completely dried it was soft, white, somewhat brittle, with a fibrous structure, and crumbled under the knife. Examined by the microscope, it presented none of the usual characters of muscular fibre. It appeared to be a confused network of fibres cemented by a white fatty-looking substance. It had a disagreeable rancid odour, which was increased when the substance was heated. It was in great part dissolved by alcohol, and the solution became opaque on adding to it water. It readily floated on water, forming an opaque solution when boiled, and the greater part was dissolved, but the liquid did not become clear on filtration. The solution had a slightly acid reaction to litmus paper. When heated with potash it became clear, and evolved ammonia. The substance was almost entirely soluble in potash, and the solution gave a white precipitate with acids. The potash solution contained no trace of sulphur. It formed a red-coloured liquid when boiled with strong hydrochloric acid, and was carbonised by sulphuric acid. The aqueous solution contained no calcium, sulphates, or phosphates; it contained an abundance of alkaline chloride with animal matter which reduced nitrate of silver. It was only partially fused at 212° F. When heated in a close tube, it gave out an offensive rancid odour, evolving ammonia

and traces of sulphur compounds; it readily melted, and by continuing the heat a dense oily vapour having an acid reaction distilled over, a carbonaceous residue being left in the tube. When heated on platinum it melted, took fire, and burnt with the bright yellow flame of a hydrocarbon. It left an ash of a brownish colour owing to the presence of ferric oxide; this residue amounted to 5 per cent. of its weight. The residue was in great part soluble in water, the solution having a strong alkaline reaction and effervescing with acid. It contained carbonates of potassium and sodium, phosphate of calcium, and chloride of sodium, as well as traces of alkaline sulphate and ferric oxide. Adipocere, therefore, does not appear to be a definite compound. It is a variable mixture of the fatty portions of the body with altered organic tissues. It contains in a concentrated form, besides ammonia as a result of decomposition, the bases as well as the salts which are found in the animal solids and fluids. These appear to be intimately combined with the fatty portions of the tissues.

Where Adipocere is formed.—Any part of the human body may undergo this change, but all parts are not equally susceptible of it. In order that the adipocere described by Fourcroy should be found, it is indispensable that the animal fat should be in contact with substances containing nitrogen. Experiment has clearly established that neither pure fat nor pure fibrin, when kept apart, will become thus saponified. Orfila found by comparative experiments that the skin deprived of all fat did not undergo this change, but when the fat was allowed to adhere to it became saponified. Upon the knowledge of these facts the following theory of the production of adipocere was founded. The fat containing no nitrogen could not furnish ammonia, and consequently could not spontaneously change into this substance. The fibrin of the muscular system was therefore supposed to produce ammonia by giving up hydrogen and nitrogen; and this alkali combined with the fatty acids of the body to form a soap. (See Ure's Dictionary, article "Adipocere.") Devergie has shown that the fat of the female breasts, that of the hollow of the cheeks, and other large fatty accumulations, are the first to take on this change, while the fatty layers immediately in contact with the muscles present no appearance of saponification until a considerably later period. We have observed this change in a body after interment for a year, in the fat of the kidneys and omentum, as well as in the fatty appendages of the large intestines. As the fat of the body is contained in a cellular membrane (a nitrogenous compound), and is traversed by the blood and other nitrogenous fluids, the nitrogen is as readily, perhaps even more so, judged by the above facts, furnished by these as by the fibrin of the muscles. So, again, the skin and fat, separated from the muscles, will become converted into adipocere. The fibrin of muscles, therefore, although unquestionably it may be one source of the ammonia, is not the sole source. Oil or fat exists throughout the soft organs and tissues of the whole body; hence every part may undergo this transformation. When the change is complete, the body maintains its condition for many years. Thus in one instance, after seventeen years' burial in a grave, an exhumed body was found to be converted into this substance, and many of the organs could still be identified (*Phil. Med. Exam.*, April, 1847, p. 247).

The Time required for its Formation.—This process takes place most readily—(1) in the bodies of young persons, the fat being chiefly external and very abundant; (2) in those adults whose bodies abound in fat; (3) in bodies exposed to the soil of water-closets; (4) in those immersed in water, but somewhat less rapidly in stagnant than in running water; (5) in humid soils, especially in graveyards where numerous bodies have been piled in contact with each other. In this latter case, those which are situated at the lowest level have been observed to become the soonest saponified. The period required for saponification to take place varies according to circumstances. Devergie states that the body of a new-born child in the soil of water-closets may become entirely saponified in from six weeks to two months, while in a drowned subject in water saponification may be partially met with in three or four months, and in one buried in a damp grave from two to three years may sometimes elapse before saponification is complete. There is no doubt, however, that the process may take place partially in the dead body within much shorter periods than these. A body floating in water has been found converted into this adipocerous state in a little more than five weeks; and, with regard to the period in an ordinary grave, the case of a female may be referred to exhumed at Bristol in 1835 after fourteen months' interment. The lower part of the body was here found adipocerous. It appears that the grave was very damp, and the line of adipocerous transformation in the deceased was bounded by the level to which the water had reached. These facts are of more importance than may at first sight appear, since a legal question of survivorship, in at least two cases, has turned upon the shortest period required for the production of true adipocere in the dead body.

The editor is unable to find any more recent references to the time required for the formation of adipocere in temperate climates. He has himself only seen one case in 1896 in a child that had been kept six months in a bandbox under a bed.

Lastly, it is worth recording that Billroth removed the fruit of an extra-uterine pregnancy *perfectly* converted (bones and tissues) into adipocere, every part being entire. The woman was believed to have been pregnant two years before the operation was performed (*B. M. J.*, December 4th, 1880, p. 897).

Dixon Mann ("For. Med.," p. 58) remarks as the results of his experience that "two to three months' submersion in water may be taken as about the shortest time in which it is formed. Traces, however, have been found in from four to five weeks. In moist earth it takes longer to form—eight to twelve months. It may be accepted that in temperate climes indications of saponification, in bodies placed under circumstances favourable to its production, may be met with in one month after death. For the whole of the soft parts to be converted into adipocere would take many years." He then quotes the following from the *Ind. Med. Gaz.*, 1889:—

"The following cases reported by Mackenzie occurred in Calcutta:—(1) A male Hindoo was killed by the kick of a horse, and was buried the following day. Four days after burial the body was exhumed in order that an inquest might be held. It was in an advanced state of saponification externally, the heart and liver being also saponified.

(2) A young Chinese woman, alleged to have died in child-birth, was buried; circumstances necessitated an inquest, and the body was exhumed seventy-six hours after interment, when it was found to be considerably saponified. These bodies were buried in a soft, porous soil, saturated with moisture, the temperature being high; the body last mentioned was enclosed in a wooden coffin. (3) Another case was that of a European sailor who fell into the river Hooghly and was drowned; eight days and ten hours after the body was recovered. The external parts, the heart, liver, spleen, kidneys, stomach, intestines, and bladder, were saponified. (4) Another young European was drowned in the same river, his body being recovered seven days after. It was in an advanced state of saponification externally, the lungs, heart, liver, kidneys, stomach, and intestines were also saponified, and what is very curious is that the stomach contained undigested food—flesh and potatoes—of which the flesh was entirely saponified, the potatoes not being altered in the least. Other instances of early conversion into adipocere are recorded as occurring in India. In one case the body was saponified externally and internally in two days."

The following very difficult case arose early last century regarding the time required for the production of adipocere:—

The property of a gentleman who had committed suicide by drowning was seized under a commission, and an action was brought to recover it at the Warwick Lent Assizes, 1805, on the ground that the insolvent was dead at the time the commission was issued. The following is an outline of the case:—

The deceased, who was in a state of insolvency, left his home on November 3rd; and on December 12th following—*i.e.*, five weeks and four days after his departure—his body was found floating in a river near the place where he resided. A commission of bankruptcy had been taken out against him a few days after he was first missed, and before it was known that he had destroyed himself. It became therefore important to determine whether he had drowned himself (for there was no doubt of his having committed suicide) *before* or *after* the date of issuing this commission. If it could be shown that he was already drowned when it was issued, the commission would be void in law, and his property could not be seized under it. The litigation then turned upon the question whether he had drowned himself on the day of his leaving his house, or at some subsequent time. The body was found floating with the head and feet submerged. On being taken out the face was covered with a muddy slime. The body was discovered on a Wednesday, and a coroner's inquest was held on the following Saturday. On the day before the inquest three medical men examined the body with a view to ascertain whether any change had taken place in it which could justify an opinion as to the time during which it had been lying in the water. The muscles of the buttocks were found to be converted into a fatty substance, very much resembling suet (adipocere). The face was completely disfigured by putrefaction. The hair of the head separated from the scalp by a slight pull. The other parts of the body were firm and white, without any putrefactive appearance. The clothes externally seemed unchanged in any way; but the shirt and neckcloth were so rotten as to be torn by the slightest force.

A medical witness for the plaintiffs stated it as his opinion that the body could not have been less than *six weeks* submerged. Three or four weeks would not have sufficed to produce the appearances met with; the adipocerous state of the body could not have been brought about in *less* than six weeks. He admitted that he had met with an instance in which a body taken from the Severn had a spermaceti appearance within a shorter time, although the change had not advanced so far as in this instance. Another witness said that the parts of the thigh and abdomen were changed into a soapy fat or adipocere. He supposed the body must have been under water for more than six weeks; he therefore thought the deceased's body must have been in the water during the whole time that he was absent. If it had been exposed to the air it would not have presented the appearances met with. He admitted he had said that the body was in such a state that it would be

impossible to express an opinion. Gibbes had been able to procure a small quantity of adipocere from muscle by maceration in water for a *month*; but in general it required a much longer period for this transformation to take place. Upon this evidence, the jury were of opinion that the deceased was not alive at the time the commission was taken out, but that he had been dead for the whole period of his absence, and the bankruptcy was accordingly superseded.

In medicine, as in law, there are always two sides to a speculative question. The case *primâ facie*, as we have seen, was in favour of the plaintiffs. The state of the body supported this view, although it might have been contended for the defendants that a few days more or less would have made no difference in the results, and that deceased might therefore have been alive when the bankruptcy was declared. The verdict of the jury was physiologically well founded. The general period required for the production of adipocere in drowned bodies is stated by most observers to vary from three or four months to a year. Its occurrence in a body to any extent within five weeks and four days must be regarded as an exception to an extensive series of observations. The witnesses for the plaintiff were then justified in assigning the longest possible period that the circumstantial evidence would admit for its production in this instance. The facts of this case show that adipocere may be produced in the body of a drowned subject within a period of six weeks. The defendants wished to make it appear that the adipocerous transformation might take place with much greater rapidity, but there were no facts to render this view probable, while there were many facts in support of the contrary opinion. One instance of its early production is related by Harlan. Having occasion to macerate the cranium of a fat negro in the summer, it was placed in a barrel of water, and kept closely covered over. About six weeks afterwards he observed the head floating on the surface, and rather inclined on one side. The portion of the head which floated above the level of the water was tumefied, and on cutting into it the whole substance down to the bone was found converted into adipocere; but that portion of the head and face which was immersed in water was in a putrescent state.

It may be as well to compare the facts of this case with the rules laid down by Devergie for determining the period during which bodies have remained in water. The deceased was an adult, and the drowning took place during the winter season. It is therefore a favourable case for testing the value of these rules. Devergie fixes the earliest period for the production of adipocere at about two months and a half. He then speaks of its commencing in the cheeks, chin, breast, groin, and fore part of the thighs. Here, however, in less than six weeks, the adipocerous change had taken place completely in the muscles of the lower part of the abdomen and of the buttocks. Devergie states that the hair of the scalp becomes loose in about two months; here it separated with the slightest pull in six weeks. The data furnished by this medical jurist would therefore tend to assign a much longer period of submersion than six weeks to a body presenting the characters observed in this case. It is scarcely necessary to remark that rules of this kind must be regarded only as remote approximations to the truth.

In the *Ind. Med. Gaz.* for June, 1902, there is a very important

article on the formation of adipocere, important because of the facts contained in it. With the editor's (*Ind. Med. Gaz.*) consent, it is here reproduced nearly verbatim :—

"*Adipocere in India.*

"Some of our readers may remember that Dr. S. Coull Mackenzie, when police surgeon, Calcutta, published (*Ind. Med. Gaz.*, 1889, p. 42) a series of eight cases of saponification which he had met with during nine years' medico-legal work in Calcutta. The first case (August, 1880) was in 'an advanced state of saponification,' and was found in a tank, having lain there apparently 'for several days.' The second case was the body of a syce, exhumed from a damp Mahometan burial-ground four days and four hours after interment; it was also found to be in 'an advanced state of saponification' (July, 1883). The third case was a Chinawoman, whose body was disinterred on 2nd September, seventy-six hours after burial. It was also in an advanced state of saponification. The next five cases occurred in bodies drowned in the Hooghly. The first was a Bengali, drowned in a storm; the body was examined three days after, and the internal organs were saponified. The second case was a European adult, who fell (September, 1881) into the river; the body was found after two days, and 'all external portions of the body were found to be saponified.' The third case was that of a European sailor, who fell into the Hooghly on 6th October, 1883; the body was found after eight days and ten hours; 'the external parts, heart, liver, spleen, etc., were saponified.' The fourth case was also a sailor drowned in the river on 2nd February, 1885; the body was not recovered for fifteen days, and was 'then in an advanced state of saponification.' The fifth case was a European youth, who fell into the river on 26th September, 1885. The body was recovered after seven days, and was found to be in an advanced state of saponification.

"Dr. Coull Mackenzie thereupon remarked :—

"'The cases of Sk. Etwari and Athow (the first two) were most interesting as well as instructive, as they show that the conditions obtaining during the rainy season in the soft and porous soil of Lower Bengal, saturated with moisture, and of a high temperature, facilitate this condition of putrefaction, and in three or four days have the power of saponifying the external parts of the body, even though buried in a wooden coffin, as was the case of the Chinese woman Athow.

"'The last five cases point to the fact that in the river Hooghly during one of the months of the cold season (February) not only the external tissues of a body, but also six of the internal organs, were found to be saponified in a little over fifteen days; that in one case during the hot season (May) the external tissues as well as the internal organs were saponified in three days. Lastly, in the hot, steamy, rainy months of September and October, in three cases saponification was found both externally and internally from two days to eight days ten hours. In the case of the lad Chapman, the fleshy portions of the undigested food in the stomach were converted entirely into adipocere in seven days.'"

The writer then concludes his paper by quoting from European authorities, who consider that saponification does not take place in

Europe in less than three or four months, "Taylor stating that the shortest period of the occurrence of adipocere in water is a 'little more than five weeks.'"

"These observations are of the first importance, and those who knew Dr. Coull Mackenzie's careful methods and long experience had little hesitation in accepting the above observations, but in the year 1897 a paper appeared in our columns (April, p. 134) which strongly challenged these conclusions. This was from the pen of Dr. G. H. F. Nuttall, now of Cambridge, who was then studying in the pathological laboratory of Professor Thierfelder in Berlin. Dr. Nuttall pointed out that Mackenzie's observations were the only ones he could find bearing upon the subject of adipocere formation in hot climates, and they were in opposition to received opinions on the subject based on experiences in Europe. He also stated that 'normal internal organs are not converted into adipocere' unless they have been in a state of fatty degeneration. Dr. Nuttall, while admitting that 'adipocere may be formed more rapidly at a high temperature,' concluded his paper (p. 135) by saying that 'besides the doubtful observations above noted' (*i.e.*, Mackenzie's) 'we have not found any publication mentioning the occurrence of adipocere in warm countries.' He also suggests that Mackenzie may have been 'mistaken,' for 'Hofmann states that muscular tissue which has macerated and putrefied in water presents an appearance sufficiently similar to deceive the unpractised eye.'

"In the next issue of this *Gazette* Surgeon-Captain (now Major) D. M. Moir, I.M.S., challenged Dr. Nuttall's arguments and protested against the way in which he dismissed the observations of such a careful and experienced observer as Coull Mackenzie, and in support of the latter's statement he quoted a case of his own, in which he had a body exhumed in October, 1891, near Chittagong, which had been buried three weeks before on the banks of a large tank. On exhuming the body Major Moir was pleasantly surprised to find no disagreeable smell, and the body had undergone saponification, so much so that he was able to confirm the report of the first post-mortem examination in every particular. This body had been buried in the end of the rainy season, in about three feet under the soil, which was alluvium with a substratum of clay, and the soil was moist owing to the rainfall of three previous months.

"The next case which we can find recorded in India is one sent to the Chemical Examiner, Calcutta, by Dr. Reginald S. Ashe from Mymensingh. This was the case of a boy aged nine, who was buried on 30th September, 1897 (see *Ind. Med. Gaz.*, March, 1898, p. 83). Circumstances led to the exhuming of the body on the fourth day after, and Dr. Ashe found the skin of the abdomen, chest, and upper and lower extremities dry, mottled, and waxy-looking, and free from all offensive odour. He sent the heart, some of the omental fat, muscles, and skin, to the Chemical Examiner, who reported that '*very partial saponification had taken place in the tissues.*' Dr. Ashe concluded that 'adipocere can begin to form in India four days after death' under conditions, as in this case, where the body was buried in a shallow grave, covered with nine inches of water.

"It is difficult, in view of Mackenzie's cases and the two just quoted, to resist the conclusion that the opinion held in Europe needs

considerable modification. In Dr. Ashe's case not only did chemical analysis prove that saponification had begun, but the specimens were shown by Major C. H. Bedford, I.M.S., the Chemical Examiner, to the late Dr. Evans, then Professor of Pathology at the Medical College, Calcutta, and both medical officers entertained no doubt as to the reality of the saponification."

12. Mummification.

This process in a dead body may be (*a*) natural or (*b*) artificial.

Natural Mummification.—We have seen that one of the prime conditions necessary for putrefaction is a sufficiency of moisture in the tissues to enable the microbes to live and continue their work of decomposition. If this condition is not fulfilled the body may undergo the process we are speaking of, and thereby be preserved for a long period of time in an almost unaltered shape; it will ultimately crumble down into a fine impalpable powder.

Circumstances tending to Natural Mummification.—It is reasonable to infer that these imply a free circulation round the body of dry warm air or the presence of such a degree of heat that the natural water of the tissues is rather rapidly evaporated. Such conditions are met with in the hot and arid sands of Egypt, or under such circumstances as a body being placed in the roof of a house in a warm atmosphere with free circulation of air. Numerous instances of this kind have been reported. It is much less common to find it in cases where the air might be supposed to be at rest, but Ogston records one case of the body of an infant that appeared perfectly mummified after concealment for one or two years in a dry stone wall, and a second case of a similar kind in the body of a child that had been shut up in a box for three months. In a case where two children had been buried in a dry soil for seven months, partial mummification had occurred in both. This case is complicated, however, by arsenic having been found in the bodies, and it is easy to see that if putrefaction be arrested by any such means mummification might take place from simple evaporation. *Vide* also *supra*, "Influence of Moisture on Decomposition."

The editor is not aware of any case giving rise to serious medico-legal difficulties; the evidence of the time required for the process, and also of how long such a dried mummy might be preserved, is too loose to be of legal value.

Artificial Mummification only requires mention owing to the fact that in such manipulations of a body antiseptic substances are used (commonly arsenic) and might obliterate any chances of detecting the cause of death were poison suspected.

Summary of Signs of Death.

We have now fully considered the signs of death and the changes that take place in the body after death. We may briefly discuss them in very general terms as indicating the reality of death and as giving proofs of the date of death. We shall then quote several cases of difficulty.

Reality of Death.—Each of the ordinary signs of death has been found to be open to fallacies when considered alone, but in their

totality they offer no room for mistake, provided that observations are carefully made over a few hours, and the editor must express his own total disbelief in premature burial, in England at any rate, and also his conviction that it is quite unnecessary to wait for actual signs of putrefaction before admitting that death has taken place.

How long since Death took place.—The modifying conditions have been seen to be so very variable in themselves and so doubtful in their *precise* action that in broad general terms it may be said to be impossible to so fix a period of death as to entirely prevent an honest difference of opinion. Nevertheless it is well worth while to insert the following general principles laid down by Tidy ("For. Med.," p. 119) :—

A. Signs of Death present in Bodies dead at the longest from ten to twelve hours.

1. Complete cessation of respiration and circulation.
2. Loss of lustre in the eye, immobility of the pupil, and loss of the normal tension of the globe.
3. Inability to produce reaction unless it be contraction of muscles by stimuli, which reaction only continues so long as the stimulus is applied.
4. Extreme pallor (ashy whiteness) of the body. (Exceptions : jaundice ; the yellow discolorations arising from the action of poisons, tattoo-marks, the edges of ulcers, bruises and wounds inflicted during life, extravasations (as in purpura), etc.)
5. Coldness after from eight to twelve hours.
6. A state (strikingly shown in the globe of the eye) of general relaxation and flaccidity (unless in the case of the muscles rigor mortis be present), with flattening of the nates, calves, etc., when subjected to the pressure of their own weight.
7. Rigor mortis.
8. Hypostases in the dependent or posterior portions of the body and of the viscera.

B. Signs of Death present in Bodies dead from two to three days.

In addition to the preceding signs, we find—

9. Coagulation of the blood.
10. Rigor mortis may be present or may have passed off, a condition of general flaccidity, together with incipient signs of putrefaction, being apparent.

C. Signs of Death in Bodies dead for more than three days.

Except in very rare cases, there will now be signs of *putrefaction*. Exceptions may occur during very cold weather, or in the case of bodies preserved in ice, also after certain modes of death (as alcohol poisoning, etc.), or where some method of hindering decomposition has been employed.

When bodies are green from putridity, bloated, and excoriated, the period of death cannot be fixed with even approximate certainty.

At later periods mummification or the formation of adipocere may be found.

13. GENERAL INFERENCES TO BE DRAWN FROM A DEAD BODY APART FROM THE CAUSE OF DEATH.

It frequently happens that the exact cause of death is of less importance in helping the ends of justice than the deductions which can be drawn by a skilled medical jurist from the circumstances surrounding an unknown dead body. Having reviewed the signs of death, with the changes resulting in the body from death, we must now go back to consider some of the problems which may be solved relative to the body by general observation on the changes we have described.

Deductions as to bloodstains (*q.v.*) or wounds (*q.v.*) and such special features will not be here considered. We shall proceed in the following order :—

1. Deductions to be made from the position of the body before decomposition : (*a*) from its posture ; (*b*) from hypostases.
2. Inferences as to the time of death of a person who has not yet begun to decompose.
3. Inferences as to the time of death of a person who has begun to decompose.
4. Criminal cases in which these inferences were much to the fore.
5. Inferences from putrefaction as to how long a body has lain in the water.
6. Decomposition contrasted with the results of disease, poison, or violence.
7. Post-mortem digestion of the stomach.

1. Inferences from the Position of a Dead Body as to Interference at or after Death.

(a) From its Posture.—The postures in which the bodies of persons found dead from any cause are discovered may, in numerous cases, be brought forward to support a charge of murder, or, at least, of criminal interference; but great care is always required in the application of medical principles to the elucidation of these cases, as well as a good general acquaintance with the various phenomena immediately preceding and following death.

As the body becomes rigid in the position in which it happens to be on cooling, and assumes exactly the attitude of the person at the time of death, careful observation may, in some instances, show whether, in a case of violent death, it was or was not interfered with *before* rigidity took place. A question of this kind arose in the following case :—

> The deceased was found lying dead in the room where the murder had been perpetrated; there were marks of blood in various places, and the body had evidently been removed from the spot where it had fallen; it had been laid out. The clothes had been tucked round it, and a piece of black cloth had been placed over the face.

A question arose as to whether the body had been thus removed before or after rigidity occurred. As it was found evenly laid out, the probability was, that it had been removed while the limbs were pliant; and they had then become rigid in this position. If a body be removed during the state of rigidity, it may be in some instances indicated by the position of the still rigid limbs not being adapted to the surface on which the body is found lying. It has been already stated that the

first effect of death, in the absence of cadaveric spasm, is relaxation of the muscles; the body then disposes itself according to the surface on which it happens to be lying; the arms or legs may be more or less fixed or contorted, and become rigid in the position which they assumed by gravitation at the time of death. The lower jaw, if left to itself, drops and becomes rigid in this position. When a body is found rigid, with the members evenly extended, and the jaws closed, this is, *cæteris paribus*, strongly indicative of interference while there was warmth and pliancy in the limbs. When, on the other hand, the body is found rigid and doubled up, with the limbs more or less twisted, lying on an even surface like a bed, the probability is, according to circumstances, that the body had been moved from the spot in which the person had died, and in which rigidity had supervened. In suicidal hanging, the body, and especially the extremities, are now and then found twisted in a singular manner around articles of furniture. In such cases, the general muscular convulsion, at the moment of death, will physiologically explain what to uninformed persons may appear physically incompatible with the deceased having destroyed himself.

The following case will serve as an illustration of the occasional importance of these inquiries:—

In June, 1855, Robert Reid was tried before the High Court of Justiciary at Edinburgh for the murder of his wife. Among the medical circumstances which gave rise to conflicting opinions was one which referred to the posture in which the body of the deceased was found at half-past two o'clock on the day of the supposed murder. It was thus described by the witnesses: "She" (deceased) "was sitting on the floor by the side of the bed, nearly naked, with a portion of the bed-clothes wrapped around the lower part of her body, the head erect, but inclined a little backwards and to one side, the face being towards the bed. The left arm hung down by her side, with the back of the hand on the ground, the right arm resting by the elbow on the bed, and maintained in the upright position without any further support, as if she had been in the act of putting it to her face. The legs were crossed under the trunk, the left being less protruded than the right."

This extraordinary posture was presumed by all who saw it and by the medical witnesses for the prosecution to be such that the deceased could not have assumed it herself in the act of dying; and this was rendered still less probable when it was considered that the cervical vertebræ were fractured, and one of them was displaced, so that she had probably died a violent and very sudden death. The attitude appeared to be also quite irreconcilable with the supposition of death from accident or suicide. The chief question seems to have been, whether, admitting that the prisoner had actually placed his wife in this posture, the maintenance of it was to be ascribed to a convulsive spasm, simultaneously occurring with death, or to the supervention of ordinary cadaveric rigidity. If the posture were admitted to have been due to cadaveric rigidity naturally supervening, then the inference would be that the deceased had been dead at least some hours. The prisoner was proved to have been at home from nine until half-past nine; the deceased's body was discovered at two, and as the prisoner had not been at the house between half-past nine and two, so it followed that, supposing him to have been guilty, he must have committed the murder during the half-hour that he was at home. Hence cadaveric rigidity must have come on in four hours and a half after death. On

the other hand, it was urged that the attitude of the body and the singular perpendicular position of the right arm were due to a spasmodic contraction of the muscles in a fit, at the moment of death, persisting under the form of cadaveric spasm. The non-medical witnesses stated that the body of deceased when found was perfectly flexible, and the arms and legs so pliant, that they could be easily stretched down; indeed, the whole body was so yielding as to admit of its being directly laid out at length on the floor. The body was partially warm when first found, but, as it has been already observed, this is quite compatible with the occurrence of rigidity. Certainly, however, where a body is warm, and the members are easily moved from their position, the presumption is rather in favour of the fixed posture being due to muscular spasm than to cadaveric rigidity.

The witnesses for the defence considered that the posture of the deceased was owing to simple rigidity. Fletcher attempted to explain the facts by supposing that the deceased had probably fallen in a fit while getting out of bed during the absence of the prisoner, admitting that the prisoner might on his entrance, at about nine o'clock, have attempted to raise the body, and thus have given the erect position to the trunk, while the perpendicular position of the arm was entirely due to spasm. It was urged that the woman had been previously subject to slight paralysis and convulsive fits, and that the occurrence of a fit, under the circumstances, was not unlikely. The position was not such as we might suppose a body to assume when a person has died under a cataleptic seizure. On the other side, it was considered to be improbable that the prisoner could have placed the deceased in the attitude in which she was discovered, admitting her to have died in any other posture, since at the time he did it the body must have been either rigid or not. If it were rigid, he could not easily have bent the members from the position which they had already assumed; and if it were not rigid, he must have used artificial means to keep the members and trunk in the extraordinary position in which they were found; for it was not likely that he would have purposely held her head and arm in such a singular attitude until her body had become fixed. Indeed, in order to accomplish this, he must have waited until it had become cold, whereas it is stated to have been found with some warmth and pliancy about it. Besides, it would be impossible to assign any reason for so doing, since he would be ignorant of the medical difficulty connected with it.

The prisoner was discharged on a verdict of not proven, because it was not satisfactorily made out that he had really caused his wife's death. The state in which the deceased was found created a presumption that she had died from natural causes not long before the discovery of her body, therefore at some time between half-past nine and two, and while the prisoner was absent from the house. The account of this case, as given by Fletcher, was most favourable for the prisoner. He suggested many ingenious explanations for circumstances which were certainly very strong against the prisoner. The verdict of not proven sufficiently attests the opinion of the jury; and had the medical evidence respecting the cause of death from violence been a little clearer, there is hardly a doubt that the prisoner would have been convicted.

Whether this was a case of death from natural causes, or, as alleged, from an injury to the spinal marrow, we must regard the attitude in which the body was discovered as very unusual. There were difficulties in the way of an explanation, whether we suppose the prisoner to have interfered or not with the position of his wife's body. Had a proper examination been made by medical men when it was first discovered by the neighbours, some of these difficulties would not probably have existed. With a fracture of the dentiform process and a dislocation of the first and second vertebræ, it is not likely, unless the body had been supported mechanically by the clothes which, it is said, presented the appearance of having been dragged off the bed with it, that a person so injured would die in the attitude in which the deceased was discovered, or that she could have had the power to assume it spontaneously after such a severe injury to the spinal column. The probability is, that the body would have been found lying on the floor.

In this trial the question was raised of the passage of a living contraction of a muscle into cadaveric spasm, which we have fully discussed.

While rigidity, in peculiar positions, may sometimes indicate murder, or some form of violent death, by fixing the body in a position which it could not naturally have assumed, and which cannot be easily altered during the rigid state, we must beware that we do not give an undue importance to this sign of death as a proof of violent usage. This caution is especially required in the cases of drunkards, for the body of a person who dies in a fit of drunkenness may be found contorted and arranged in a way which might be apparently incompatible with either accident or suicide.

(b) From Hypostases.—We have already noted that hypostases form in the most dependent parts of a body, and also that they may be disturbed by the gases of putrefaction, and that they may be observed internally as well as externally. Hence, putting these facts together, it is possible by noting the position of the hypostases and also the position of the dark part of a large clot of blood—in heart or aorta, for instance—to tell whether a body lay on its face, or back, or side after death, and also whether it has been moved since death. Audral found the anterior wall of the stomach strongly reddened in a body that had lain on its face after death.

It will probably but seldom happen that such moving of a body is of importance, for bodies are almost invariably moved to a mortuary of some sort before inspection, but in the cases of bodies found under suspicious circumstances notes should be made of these points, for it frequently happens that little-noticed points become of great importance in the hands of a clever counsel.

In this connection it is not out of place to call attention to the differences between ante- and post-mortem clots of blood, for the latter may give very distinct clues to the position a body lay in after death, while the former give no indication.

In the heart and great vessels (in the smaller ones too, for that matter, but it is not so obvious or so often looked for) we find frequently enough large masses of clot. If these be of post-mortem origin they will show (*a*) that the red corpuscles, being of a greater specific gravity than the serum or the white corpuscles, have sunk to

the lowest part, and (*b*) that the clot as a whole is in consequence very obviously divided, and pretty sharply too, into a lower coloured and an upper colourless or white-coloured part. The differences between ante- and post-mortem clot may be thus tabulated :—

Ante-mortem.	*Post-mortem.*
1. More or less uniformly coloured of a greyish red, certainly with no *marked* contrasts.	1. Colour as above, two distinct layers, contrasted.
2. Firmer in consistency.	2. Softer.
3. Shreddy, and often can be stripped or peeled off in layers.	3. Each part of the clot is homogeneous in construction, like jelly, and it cannot be thus stripped into layers.
4. The surface of the vessel appears roughened when the clot is removed; the clot adheres pretty firmly. N.B.—Do not mistake the interlacing of a clot amongst the chordæ tendineæ of the heart and the consequent difficulty in its removal for adherence as here mentioned.	4. Surface of vessel quite smooth and healthy-looking after clot is removed.

2. Inferences as to the Time of Death from the Condition of the Body before Putrefaction has set in.

The changes which take place in a dead body before the commencement of putrefaction, if accurately observed, may sometimes enable a medical witness to form an opinion of the time at which the deceased died. The dead body of a person may be found in a house with marks of murderous violence upon it; the crime may have been so recently perpetrated, that the body still retains the warmth and pliancy observed in the recently dead, or it may be found in a cold and rigid state. A person charged with the murder may be able to prove that he had not been in the house for many hours or days, or evidence may be adduced to show that he was there at a time which would correspond to the condition of the body when found. In cases of sudden death from violence or suspected poisoning, a medical man, by observing the state of the body, may frequently form a judgment of the time at which death occurred, and therefore of the period at which poison was taken by deceased, or violence was inflicted on the body.

In the following case of murder and suicide, the murderer was clearly pointed out by the difference in the condition of the two dead bodies when they were first discovered :—

In 1836, a man and his wife were found dead in bed, and their bodies were covered with blood from wounds inflicted on both. In the case of the woman there was a deep incision in the throat, besides a wound under the chin, and another on the side of the head. The man's throat was also severely cut; the razor with which the wounds had been inflicted was found on the bed, within a short distance

of his right hand, as if, in the last act of life, he had endeavoured to throw the weapon from him, but had failed in the attempt. The body of the woman was cold and rigid; that of the man was warm.

The nature and direction of the wounds, and the marks of violence on the woman's person, were such as to render it probable that she had not committed suicide, and the condition of her body showed that she had been dead many hours. On the other hand, the wound in the man's throat was such that he could not have long survived its infliction; and as his body when found was warm and pliant, it was a reasonable inference that the wife had died first, and from wounds inflicted by her husband, as no other person had access to the house. If the body of the wife had been found warm, while that of the husband was cold and rigid, the inference of his having been her murderer (the wound in her throat being of a nature to produce instant or very speedy death) could not have been sustained. In forming a judgment of priority of death in such cases, the sufficiency of the wound to produce instant or rapid death must always be taken into consideration. A person may inflict on another a slight wound, which may prove fatal by hæmorrhage only after some hours, while he may afterwards inflict upon himself a wound which would instantly destroy life. In such a case the body of a murderer would be found cold, while that of the victim, by reason of the death being more recent, would be warm. In the case of a woman who was found dead in her apartment with her throat cut in 1847, it was ascertained that, when first discovered, the body was so warm as to render it highly probable that the crime must have been committed within an hour. This observation tended to prove the innocence of a person who was suspected of the murder, because it was known that he had been absent from the house for at least five hours.

In the following case, which is a type of many, the theory of suicide was sustained, and that of homicide completely rebutted, by a medical inference from the condition of the body:—

In 1830 the Prince de Condé, or Duke of Bourbon, was found dead in his bedroom, in the Château of St. Leu. When discovered, at eight o'clock in the morning, the deceased was found, partly undressed, hanging by his cravat to one of the window-shutters. The body was cold, and the lower extremities were quite rigid.

As in asphyxia from hanging the warmth of the body is usually preserved longer than under common circumstances, *i.e.*, from twelve to fifteen hours, before which period rigidity is seldom complete, the medical examiners inferred that the deceased must have died very soon after he had retired to his bedroom on the previous night. As this was proved to have been 10 p.m., it followed that only ten hours had elapsed—a short time for cooling and rigidity to have taken place. It was thus rendered probable that the hanging took place soon after the deceased had entered his bedroom. It was alleged that the Duke had been murdered, and his body afterwards suspended by his murderers to create the suspicion of suicide. The condition of the body, among other circumstances, was, however, adverse to this presumption. From 10 till 12 p.m. it was proved that there were numerous attendants moving about near to the Duke's apartments. These persons must have heard any unusual noise which the Duke would probably have

made in resisting his assailants. But no noise was heard in the apartments at that or any other time, and the presumption of this being an act of homicide was therefore strongly rebutted. Had the body been found warm and pliant, and the joints flexible, the inference would have been that the deceased had died more recently, and therefore at a time when murder might have been perpetrated without attracting the observation of his attendants. As it was, the coldness and rigidity of the body justified the medical opinion expressed, and tended to prove that this was really an act of suicide.

Criminals sometimes unknowingly furnish important evidence in reference to the condition of the dead body.

At the Lowes Autumn Assizes, 1860, a schoolmaster named Hopley was convicted of flogging a pupil to death. There was reason to believe that the boy had died during the actual beating. The accused stated before the coroner that he went into the deceased's bedroom about six o'clock in the morning, and found the deceased dead, his body cold, and his arms stiffening. He suggested that he might have died from natural causes. It was proved that the prisoner was heard in the act of beating the deceased up to half-past eleven on the previous night; and as the body was cold when found, and rigidity was commencing, there was a strong probability that deceased must have been dead at least six or seven hours, and, therefore, at a time when the prisoner was last known to have been with him. The body was well developed, covered with bedclothes, and the temperature not at the time low.

In the case of Doidge (Bodmin Aut. Ass., 1862), who was charged with murder, medical evidence derived from the state of the dead body when found tended materially to corroborate the circumstantial evidence against the prisoner. The deceased was last seen alive at 10.30 p.m. He was found about 9.30 the next morning dead in his house; he was lying on his face with his clothes on, one arm under the chest, and the other by his side. He had received on the back of the head some severe blows, which must have proved speedily fatal. The body when found was quite cold, and the limbs were rigid. It was considered by Thompson, who saw the body, and by the author, that the deceased, under these circumstances, had been dead from eight to ten hours.

There was no doubt that this was an act of murder, and that the deceased had been killed while taking off his boots before going to bed. The prisoner was connected with the act by a chain of circumstances. He was seen drinking and conversing on friendly terms with the deceased at a beershop the evening before. The prisoner left the shop at a quarter-past ten, and the deceased at half-past ten. They both lived near to the shop and to each other. A neighbour of the deceased's, who was out as late as twelve o'clock, heard at that time the voices of two persons in conversation in the deceased's kitchen. One of them he recognised as that of the deceased, and the other as the voice of the prisoner, with which he was well acquainted. This witness heard the voices for some minutes, returned into his house, and went to bed. He was soon afterwards suddenly awakened by a noise like that of a heavy fall proceeding from the deceased's kitchen, in which the dead body was afterwards found. His evidence was corroborated by that of his wife; and hence it is clear that the deceased was alive for some time after twelve o'clock that night. It was further proved that, contrary to his usual practice, the prisoner did not return home to his lodging until one o'clock in the morning; and then, in order to account for his return at so late an hour, he made a statement which was proved to be untrue. The coldness and rigidity of the body, therefore, when discovered at 9.30 a.m., considering the season

of the year and the circumstance that the deceased was in his clothes, were facts in themselves quite consistent with the occurrence of death soon after twelve o'clock at night, or about the time when a heavy fall was heard by the neighbour. Other circumstances, which were proved, left no reasonable doubt of the prisoner's guilt, and he was convicted.

Perhaps no case has brought the importance of questions of this nature so prominently before the public as that of Gardner, a chimney-sweep, who was tried and convicted of the murder of his wife at the Central Criminal Court in October, 1862.

The prisoner lived with his wife and another woman. The wife was found dead in her bedroom, with wounds in her throat, at 8 a.m. The nature and direction of the wounds, the position of the body and of the weapon, as well as other circumstances, conclusively proved that this was an act of murder; and as there were no persons in the house at the time of the occurrence excepting the woman Humbler (the servant) and the prisoner Gardner, it followed that one or both must have been concerned in the act. Gardner accused the servant of having perpetrated the murder during his absence from home; but as there was no evidence against this woman, he alone was subsequently called upon to answer the charge. The facts, as they bear upon the question which we are now considering, are very simple. Sequeira saw the body of the deceased, a healthy, well-developed woman, æt. 37, at 8 a.m. Her body was found lying on a wooden floor, covered with a flannel petticoat and a chemise. The upper limbs were cold and rigid; the face, shoulders, and chest were cold; the neck was so rigidly fixed with the trunk that the entire body was lifted up with it when the head and neck were raised; the thighs and legs were quite cold, but there was no rigidity in these parts. The only warmth found about the body was in the lower part of the abdomen, and this obviously arose from the contents of the uterus, the deceased being in the seventh month of pregnancy.

The opinion given by Sequeira regarding the time of death before its exact bearing on the guilt of the prisoner could have been known was that the deceased had been dead *above four hours*, certainly more than three, and that she could not have been dead so short a time as two or three hours when he first saw the body. This opinion was corroborated at the trial by another medical witness, Comley, who affirmed that, considering the general coldness of the body, the deceased, when seen at eight o'clock, had been dead above rather than under four hours. There was a severe wound on the throat, involving the superior thyroidal artery and other vessels. From this about two pints of blood had flowed on each side of the neck on the floor. The larynx had been laid open between the thyroid and cricoid cartilages. Blood had flowed into the windpipe through this aperture, and had thus, by obstructing respiration, produced death by asphyxia.

Without going into all those circumstances which tended to fix this crime beyond any reasonable doubt upon the man Gardner, it may be sufficient to state that the defence turned principally upon the condition of the dead body when found. It was proved that from 4 to 8 a.m.—*i.e.*, for about four hours—the prisoner was absent from home, following his usual occupation as a chimney-sweep. It was contended by his counsel that within this short period the body might have become cold and rigid as it was found, and, therefore, that the murder had been perpetrated by some one during his absence. On this theory the woman Humbler alone was guilty. The facts proved at the trial were, however, considered by the jury to be quite inconsistent

with the innocence of the prisoner, and he was convicted of the crime. The subsequent commutation of the sentence to penal servitude for life is a proof that the authorities considered that he was the principal, if not the sole, perpetrator of this crime.

The opinions given by the medical witnesses at the trial, regarding the inference derivable from the state of the dead body, were reasonable, and in accordance with scientific observations. In assigning *four hours* for the almost entire cooling and commencement of rigidity in the dead body of a woman suddenly dying in the prime of life, the body not being exposed to any specially cooling influences, it is obvious that they could not be charged with overstating, but rather with understating, the period of time required. Considering that death had taken place by asphyxia, if they had assigned six or eight hours, it would have been only consistent with ordinary experience. It is, indeed, more probable that this time had actually elapsed, and that the woman had died in from two to four hours before the male prisoner had left the house, than that her body, under the circumstances proved, had become cold and partially rigid in less than four hours. In one hundred cases observed by Wilks and the author, there was not an instance in which such rapid cooling and access of rigidity occurred. In Gardner's case, it was supposed that the loss of blood would account for this state of the body at so early a period after death; but, in the first place, the deceased did not die from hæmorrhage, but from suffocation; and, secondly, a well-marked case elsewhere related (*supra*) shows that the loss of twice as much blood in hæmorrhage proving suddenly fatal led to no acceleration of cooling or rigidity in the dead body.

As cadaveric rigidity had commenced in the upper part of the body of the deceased when it was first discovered, we may take this as a point of comparison with the actual observations of Nysten and Brown-Séquard. According to Nysten, in cases in which death took place suddenly in healthy persons either from asphyxia or as a result of hæmorrhage, cadaveric rigidity did not commonly appear until sixteen or eighteen hours after death, and sometimes lasted six or seven days. Brown-Séquard states that in the bodies of healthy persons decapitated or asphyxiated cadaveric rigidity did not appear sooner than ten or twelve hours after death ("Proc. Roy. Soc.," 1861, p. 211). Considering these facts and the circumstances under which this body was found, the assignment of a period of six or eight hours would have been quite within the limits of experience and observation. The medical opinions given at the trial were consistent with ordinary experience, and with the other facts proved in the case.

The case of Jessie McPherson, for the murder of whom a woman named McLachlan was tried at the Glasgow Autumn Circuit, 1862, furnishes an additional proof of the correctness of these views in reference to the bodies of persons found dead from loss of blood.

Macleod saw the body of the deceased on the night of July 7th, when it was first discovered. The mean temperature of the air on that day had been 50° F. "The rigor mortis was present in all the articulations, but it was then departing. The body was perfectly cold, even on the abdomen, and at the flexures of the joints. On the following day, at 10 a.m., the rigidity had gone from all the joints excepting the knees and ankles. There were no signs of decomposition, and the temperature was very cool, unusually so for the season. The room in which the body had lain

was well ventilated, but without a draught. It was below the level of the street, and the body lay on a wooden floor, and was partially covered. Further, death had resulted from violence; it had been attended with profuse hæmorrhage, and the victim was free from disease, in the prime of life (æt. 35), and of a thin, wiry frame."

Macleod considering that the rigor mortis commonly appears in from ten hours to three days after death, and that in sudden death from violence it is only slowly developed, thought it most probable that forty-eight hours after death (at the longest) would represent the time when rigidity would appear. "The more rapidly it is developed the sooner it disappears, and *vice versâ*. The average period of disappearance is from twenty-four to thirty-six hours. In the case under review, resting on the same considerations as influenced the opinion formed of the time of the establishment of the stiffening, it was thought that about thirty hours would probably represent the period of the continuance of the rigidity; and by summing these periods—forty-eight and thirty—together the conclusion was arrived at that about *three days* had probably intervened since death; and it will be remembered that it was afterwards proved that this was, as nearly as could be, the time which had passed between death and the examination of the body." "Putrefaction appears on an average, under a mean temperature, in from three to six days. It is influenced by many circumstances, of which the heat and moisture of the surrounding atmosphere, the obesity and age of the person, the cause of death, the position and coverings of the body, are the chief. In the case of McPherson there was no appearance of decomposition. The cool atmosphere, the thin body, drained of its blood, the middle age, and thin covering, all opposed its development" ("Account of the Medical Evidence at the trial of Jessie McLachlan," by G. H. Macleod, M.D., Glasgow, 1862, p. 8). This medical opinion, formed from the state of the body, tended to confirm that part of the prisoner's story which related to the time of death.

On these occasions, unless we have a due regard to all the circumstances of a case, grave errors may be committed. A period for death may be assigned which is inconsistent with the proved facts, and thus give impunity to murderers. Ollivier and Devergie were once required to examine a medical report by two physicians in which they stated that they had found the deceased, a woman, aged sixty, dead in her apartment from strangulation. When the body was found it was lying on the floor, clothed in her usual dress of cotton and flannel, in a state of cadaveric rigidity, with general lividity of the surface of the skin. It was cold, with the exception of a slight warmth which remained in the abdominal viscera when the inspection was made. From these data the inspectors came to the conclusion that the deceased had not been dead more than from fifteen to twenty hours before the time at which they saw the body. This would have fixed the date of the murderous assault at 1 p.m. on March 6th, whereas the general evidence tended to show that the crime must have been committed on the night of March 4th or 5th.

Considering that the deceased had died from asphyxia, in which case warmth is usually retained, that her body was well clothed, and yet rigid and cold, with the exception of a doubtful trace of warmth in

the abdominal viscera, Ollivier and Devergie came to the conclusion that she must have been dead for a longer period than fifteen or twenty hours; and without defining the precise time, which, under the circumstances, was not necessary, they affirmed that there was no medical ground on which such a restriction of the period of death was justifiable. They contended that cadaveric rigidity, when once established, might remain two, three, or four days, according to the season of the year and other circumstances; and that when it existed there was no rule by which it could be determined whether the body had been in this state for two or three hours or two or three days ("Ann. d'Hyg.," 1833, 1212). The retention of warmth by the abdominal viscera may be met with after fifteen to twenty hours in a much more marked degree than in this case. In one case, already referred to, the temperature of the viscera of the abdomen, more than seventeen hours after death, was found to be 76° F., although no care had been taken to preserve the warmth of the body.

Some French medical jurists have attempted to give a more definite character to these changes in the recently dead body by dividing the interval between the permanent cessation of the heart's action and the commencement of putrefaction into three stages or periods. In the first, the warmth and pliancy of the body and muscular irritability remain; in the second, these conditions are lost, and the body is cold and rigid; in the third, the body is cold and pliant, the muscles are relaxed, and the joints are flexible, cadaveric rigidity having entirely ceased. A fourth period is marked by the access of putrefaction, in the appearance of one or more well-known signs indicative of chemical decomposition. There can be no doubt about the existence of these stages, but when we attempt to define the precise time at which they commence and succeed each other, the subject is beset with great difficulty. Thus, according to Devergie, the first stage ranges over a time which cannot be more closely defined than by stating that the person may have been dead from a few minutes to twenty hours. From the differences observed in different bodies, there would be some danger in fixing these times too strictly; and a medical jurist must be prepared to find that in a question of murder a counsel who defends a prisoner will reject averages, and take for the purpose of defence the longest or shortest period of time within which the respective changes have been known to occur. In spite of this objection to medical evidence, it may be convenient to consider the subject in reference to the three stages or periods proposed by Devergie.

First Period.—This is characterised by the warmth of the body being more or less preserved, and by a general or partial relaxation of the voluntary muscles. In such a case as this, after attentively considering the various circumstances special to each which may have retarded or accelerated the cooling of the body, an inference may be drawn that death has taken place from a *few minutes* to *twenty hours*. These are the extreme limits, and the time will vary according to the degree of heat in the trunk and extremities and the degree of rigidity in the muscles, as well as in the parts of the body affected, the neck and the jaw commonly showing this condition first and the legs the last. It is rare that the warmth of the body is preserved for so long a time as twenty hours; in general it is sensibly cold within ten or

twelve, but this estimate will be more or less affected by the condition of the person who makes the observation. During this period the muscles are susceptible of contraction under the galvanic stimulus, and in the early stage under the stimulus of blows.

From observations in the wards and post-mortem room at the London Hospital, the editor (F. J. S.) is strongly of opinion that the rectal temperature is the best and most constant guide to the number of hours since death. He has found the decrements in temperature thus taken nearly constant per hour; and hence, if the temperature at death be known, a reasonably accurate result can be arrived at.

Second Period.—In this the body is perfectly cold throughout, and the cadaveric rigidity is well marked. The muscles are no longer susceptible of contracting under galvanic or mechanical stimuli. In such a case death may have occurred from *ten hours* to *three days*. It is impossible to give a more definite opinion than this, since there are conditions which may develop rigidity, and under which a body may become cold in ten hours or even in a shorter period. In one instance *already related*, a body was found *cold* and *rigid nine hours after death*. Again, there are, as we have seen, other conditions which may prevent the cooling of the body, and delay the occurrence or prevent the disappearance of rigidity for so long a period as three or even four days after death. The duration of this stage from ten hours to three days includes the average cases. Here, again, in forming an opinion we are bound to regard the age, the mode of death, and the circumstances under which the body of the deceased may have been exposed.

Third Period.—The body is perfectly cold; the members and trunk are pliant, and are quite free from any remains of cadaveric rigidity. As this condition has ceased spontaneously, the muscles no longer contract under the influence of the galvanic stimulus. Under these circumstances it may be assumed that the person has been dead from *three to eight days*. In the summer season, however, this period is much shorter; it will more commonly be found to be the condition of bodies which have been dead from one to three days.

Fourth Period.—This commences with the access of putrefaction. It is first manifested by a slight bluish green discoloration of the skin of the abdomen, and it gradually spreads throughout the body in the manner elsewhere described. Any doubt concerning the reality of death must cease when the body has reached this stage, at whatever period of time it may manifest itself. Devergie considers this state to represent the condition of the body from *six to twelve days* after death, but the fact is well known that putrefaction may manifest itself on the first or second day, and sometimes as late as the twelfth day, after death. These different periods are somewhat arbitrarily selected, and they can be looked upon only as affording approximate results. During the heat of summer a body may undergo in twenty-four hours all those changes which Devergie assigns to a period of from six to twelve days; while in winter the same changes may not be complete in a shorter period than fifteen days. The power of giving a safe medical opinion must, therefore, depend on an accurate observation of the state of the dead body when first seen, and a proper estimation of all the causes which influence or modify the successive changes. Notwithstanding the apparent want of precision which medical evidence necessarily

presents in investigations relative to the period at which a person died, yet the cases already related show that approximate results are often of great value. When founded on a correct knowledge of the state of the body, and when they are corroborated by other circumstances, they are received in law with the greatest benefit to the administration of justice.

Inferences as to Time of Death from Digestion of Food.—A suggestion has been made to the editor by Dr. Newth, of Hayward's Heath, that the state of digestion of the contents of the stomach might be used as a means of fixing the hour of death. Most elaborate tables have been prepared by Dr. Beaumont and others of the time taken by the stomach to digest certain articles of diet, of which the following may be taken as an example :—

Article.	Time for digestion. hr.	min.	Article.	Time for digestion. hr.	min.
Rice	1	0	Eggs, soft boiled	3	0
Apples, cooked	1	30	Beef	3	0
Venison	1	30	Carrots, boiled	3	15
Sago	1	45	Potatoes, ,,	3	30
Bread	2	0	Turnips, ,,	3	30
Milk	2	0	Butter and cheese	3	30
Cabbage	2	0	Oysters, stewed	3	30
Oysters, raw	2	3	Eggs, hard boiled	3	30
Eggs, raw	2	3	Pork, boiled	3	30
Potatoes, roast	2	30	Fowls	4	0
Parsnips, cooked	2	30	Wild fowl	4	30
Turkey	2	30	Beef, salt	5	30
Goose	2	30	Pork, roast	5	30
Custard, baked	2	45	Veal, ,,	5	30
Mutton	3	0			

The table must not be taken as of mathematical certainty, but may represent fair averages, and hence the first great doubt of the value of the data. Again, it must be remembered that death does not at once cause the process of digestion to stop, as we know that the stomach can even digest itself after death. With all this uncertainty, too much stress must not be placed on such evidence; it must be weighed along with all other items. Dr. Newth, however, quotes the following case as having occurred to him: "A man was found one morning some way from home, quite dead, kneeling in shallow water. He had left home about 8 p.m. the previous evening, directly after supper. In the stomach were found pieces of undigested meat and partially digested bread." He therefore gave evidence that the man died within about two hours after leaving home. Had he been found under circumstances of suspicion of possible criminal violence, the evidence might have been of great value.

3. Inferences from Observation of a Body after Putrefaction has set in.

Orfila, after having devoted many years to the investigation of this subject and after the comparative examination of some hundreds of

exhumed bodies of all ages, and of both sexes, came to the conclusion that it was beyond the reach of science to determine with accuracy the period of death from the progress of putrefaction. Bodies which had been buried for an equal length of time in the same soil under apparently similar conditions frequently presented such differences as to baffle all attempts at generalisation. This question becomes even more difficult when the body is submitted to examination, and none of the conditions under which the person has died, or to which the body has been exposed after death, are known. It will be perceived from what has been already stated that the circumstances which affect the rate and progress of putrefaction are numerous and of a variable character. If we can obtain no history of the case, a medical opinion can be little more than a conjecture; if, however, we are informed of the atmospheric and other conditions to which a dead body has been exposed, it may then be in our power to arrive at a probable, if not a definite, conclusion. In the description of the modifying conditions above given, the practitioner will find some points which may render him assistance, or, at any rate, enable him to avoid some of the serious errors which have been made by medical witnesses in reference to this subject. It has been elsewhere stated that putrefaction does not commonly commence until about the third day after death: at any rate, there is usually no external sign of the process until that date; but there are many instances known of its commencing almost immediately after death and proceeding with great rapidity, while, in other cases, more than twenty days have passed without any indication of its presence.

The experience of Wilks, who inspected more than four thousand dead bodies, may be here briefly referred to. At Guy's Hospital most cases are inspected within twenty-four hours after death, when, as a rule, the body is rigid, and no decomposition has taken place. If after two or three days much change should be present, it is generally to be attributed to some peculiarity in the cause of death. The decomposition is not shown, as at a still later period, by a mere change of colour, as a greenish hue of the abdomen, but by a redness of the whole body, and by dark stains in course of the superficial veins. Even when these external changes are scarcely observable, there may be found considerable alterations within the body, shown more especially in a discoloration of the heart and arteries by the blood and also black and green discoloration of the surface of liver, spleen, and kidneys. These changes appear to be connected with a diseased state of the blood, and are met with in those who have died of fever, pyæmia, and similar maladies. In those cases of strangulated hernia in which death speedily follows an operation, the post-mortem changes are sometimes observed to be very rapid. It is a common observation that moisture in the atmosphere appears to favour decomposition much more than heat; thus putridity is much more rapid on a moist winter's day than on a hot dry day in summer. These facts may be illustrated by cases from the records.

Cases of Unusually Rapid Decomposition.—In September, 1855, the body of a man was examined thirty-eight hours after death from an accident; it had begun to undergo decomposition in the ordinary manner. The body of another man, who had died of phthisis, was examined forty-four hours after death, and in this there was no

trace of decomposition. On the following day an inspection was made of the body of a man who had died in a few hours after fracture of the ribs. Only forty-eight hours had elapsed since death, but considerable decomposition had already taken place.

Somotimes docomposition is so rapid that in a few hours the featuros of a person aro unrecognisablo. A man, æt. 26, diod in November, 1855, of typhoid fever and perforation of tho ilium. The weather was cold and moist. When the examination was about to be made sixteen hours after death, the body was wholly unlike that of the man when alive. Thero was no rigidity; tho whole body was bloated; tho cellular tissue was greatly distended, so that when the skin was piercod the gas which escaped was easily ignited. The colour of the surface was of a reddish hue. The internal organs were also much decomposed, of a dark colour, soft, and emitted a very fœtid odour. The liver was full of gas (due no doubt to the presence of *Micrococcus aerogenes capsulatus*.—Ed.). The patient was a temperate man, and had resided in the country.

In November, 1864, a plethoric man met with an accident, and died at 10 o'clock p.m. Clegg held an inquest on the body tho next morning at 11 a.m. Although only thirteen hours had elapsed since death, the body was highly putrefied, presenting a bloated appearance, and the face was so swollen and discoloured that the features could not be recognised. The gases which escaped were so offensive that the jury could not approach the body. No inspection was made.

A man, æt. 35, shot himself with a pistol, producing fracture of the skull and injury to the brain, from which he died in six days. On December 13th, 1854, the atmosphere being cold but moist, the body was brought into the room for examination, thirteen hours after death. The rigidity was imperfect, but still present to a slight degree; the body was warm; when opened, it showed that a remarkable change had taken place internally, so that it was even suggested whether decomposition had not commenced before death. The brain was soft and decomposed; the lungs showed recent inflammation, and the air-tubes were deeply stained by imbibition; the interior of the heart and arteries was of a dark purple colour, and the clots in the heart were mixed with air; the peritoneum was discoloured; the liver presented a remarkable appearance, it was full of gas, and thus resembled a mass of fermenting dough; on the surface were bubbles of gas ready to burst; this organ contained two small pyæmic abscesses (again *aerogenes capsulatus*.—Ed.). The spleen was of a greenish colour; the kidneys closely resembled the liver, being, like it, distended from decomposition, and containing gas-bubbles throughout their substance. (See Guy's Hosp. Rep., 1863, p. 181.)

In addition to these cases, Wilks met with another in which a man, æt. 50, died from an accident in December, 1860. He lost much venous blood, and, without showing any sign of rallying from the accident, died on tho fourth day after his admission. For a few hours before death he suffered from great difficulty of breathing, and his pulse was not perceptible. The man died at 6 p.m., and in an hour or two his body was carried to the deadhouse. The weather was frosty, and there was a hard frost during the night on which the body lay in the deadhouse. On the following day (only twenty hours after death) putrefaction had advanced to such a degree that the deceased could scarcely be recognised. The skin was throughout distended by the gases of putrefaction. All the viscera were decomposed, the liver contained putrescent gases, and even the coats of the gall-bladder were distended with them. This was a case of rapid death, probably from blood-poisoning.

The following is a remarkable instance of the rapidity with which putrefaction may take place in a dead body. A man, æt. 39, was admitted into Guy's Hospital in October, 1849. He was fat, of pale complexion, and of intemperate habits. The muscles were flabby. He died suddenly after a few days, without suffering from any symptoms indicative of danger. His death took place at 10.30 p.m. The body remained in tho ward until 8 a.m. the following morning, the air having a temperature of from 60° F. to 65° F. The conditions as to cooling and rigidity were not observed during the night; but when the body was removed at the hour mentioned, decomposition had already commenced. Tho skin on the left side was raised in large vesicles, containing a bloody liquid. At 2.30 p.m.—*i.e.*, *sixteen* hours after death—the entire skin was more or less of a blue or purple colour; the eyes protruded from the sockets, and the nostrils were filled with a bloody froth, from

which minute bubbles of gas continually issued. The abdomen, as well as the scrotum, was greatly distended with gas. The groins were much putrefied, and were covered with minute blood-vesicles. *Seventeen hours* after death the skin of the neck and face had a bloated and tense appearance from the collection of gas beneath. Blue, green, and livid red discolorations were soon more or less over the whole surface, with vesicles as in the advanced putrefaction of bodies after some days' exposure in hot weather. The gases which issued in jets from every part of the skin in which a puncture was made were highly offensive. When a flame was applied to the puncture, the gas took fire with almost explosive violence. The gas did not discolour slips of paper moistened with acetate of lead or nitrate of silver; hence neither sulphuretted nor phosphorettod hydrogen was present. It burnt like marsh gas; and was probably this gas, mixed with other gases and vapours derived from putrefaction. When the tense skin of the scrotum was punctured, a jet of marsh gas escaped, which burnt steadily, with a pale yellowish flame, for above a minute. No post-mortem examination was made (*Med. Gaz.*, 1850, vol. 45, p. 17).

The condition of this body in reference to the process of putrefaction was such as Devergie assigns to dead bodies at a period of six to twelve days after death, on the assumption that they have been freely exposed to the air at a mean temperature ("Méd. Lég.," vol. 2, p. 406). Had the body of this person been found in a house under these circumstances, and had the history of the case been entirely unknown, a medical man, asked to assign a period of death from common experience in such matters, might have declared it to be impossible that the deceased could have been living within twenty-four hours previously to the discovery. Suspicion might thus be removed from persons really guilty of murder, because it might be proved that they had not been in or near the house until within a day of the discovery of the body. On the other hand, an innocent person who had been seen in company with the deceased five or six days previously, or who had voluntarily remained in the same room with the body, might be unjustly charged with having been accessory to his death. This, with other instances of a similar kind, shows that unusual caution is required in expressing a medical opinion on the time at which death took place in bodies which are found much decomposed.

The causes of this rapid access and progress of putrefaction in the body of a man dying in the prime of life, cannot be assigned to the season of the year, or to the operation of any unusual external influences. It may have been due to the condition of the body, especially of the blood, at the time of death. This man was of intemperate habits, with a flabby muscular system and low vitality. These were precisely the conditions favourable to the speedy loss of muscular irritability after death, with the appearance and disappearance of cadaveric rigidity after an unusually short duration. The fourth, or putrefactive, stage was therefore reached in a few hours. The ward temperature, 65° F., was favourable to the process, and the blood and other fluids were probably prone to decomposition. Although the body was removed into a cooler atmosphere on the morning following death, yet the process, having once commenced, progressed with great rapidity.

Marsh described a case of a somewhat similar kind:—

A man who had been ill about fourteen days was admitted into the Hôtel Dieu at Paris under Bally. He died on the night after his admission; and on examination only *eight hours* afterwards his body presented the following appearances:—The whole of the skin was distended with gases, was of a violet colour, and

studded with a vesicular eruption in detached spots, the vesicles being filled some with a reddish-coloured serum, and others with gas. The abdomen was also much distended by gas, this having accumulated not in the intestines, but in the cavity of the peritoneum. Upon cutting into any emphysematous part an inflammable gas escaped, which was readily ignited by the flame of a candle. From a perforation in the abdomen it issued and burnt with a bluish flame (*Edin. Med. Jour.*, vol. 58, p. 501). It was thought this state of the body indicated putrefaction before death; but it was merely an instance of its rapid supervention after death.

In all these cases the cause of death and the circumstances surrounding the body at and after death were also known. In the discussion on muscular rigidity and in the paragraphs relating to poison, lightning, etc., will be found statements that more or less completely explain the cases, though it must be admitted that even then there seem to exist factors the precise action of which seems inexplicable on any other supposition than the vague one that the microbes of putrefaction were unusually vigorous or found material unusually easy to work upon.

4. Criminal Cases Illustrative of the Difficulties of deciding the Exact Time of Death.

There is great difficulty in the practical application of the principles, laid down *supra*, to the determination of the probable period of death in reference to the body of a person found dead. Medical opinions are frequently required in cases of alleged child-murder on the probable date of death of a child whose body has been found in a putrefied state. With a due regard to the conditions under which the body has been placed, a medical witness may occasionally be able to say whether its state was such as to be consistent or inconsistent with the delivery of an accused woman at a particular period of time.

Greater difficulties occur on charges of murder in reference to the bodies of adults found dead under suspicious circumstances. The connection of an accused person with the act may occasionally turn upon a medical opinion respecting the state of the dead body.

Beck furnishes a case illustrative of this statement. A man named Desha was charged with the murder of Francis Baker. The deceased was last seen with the prisoner on November 2nd, 1824. The body of the deceased was found on November 8th—*i.e.*, six days afterwards—in a sheltered hollow, with the throat cut, several wounds on the head, and a wound on the chest. There was no doubt from the nature of the wounds that the deceased had been murdered, and that he must have died soon after their infliction. The defence of the prisoner rested to a great extent on the condition of the body when found, the principal question being whether the state of the body was consistent with the suggestion of violent death caused *six days* previously. When discovered it had undergone so little change that it was considered the deceased must have been alive some days after the prisoner had been last seen in his company. The body when first found is described as having been a little stiff; but after being carried some distance it became pliant. There was no appearance of putrefaction about it, either by the smell or by any change of colour in the skin. In two days after its discovery, during which period it had been placed in a room in which there was a fire, putrefaction set in, and the abdomen and face became much swollen and decomposed. At this time—*i.e.*, the eighth day after the deceased had been seen alive—much blood issued from the wounds. According to one medical witness, the wounds at this date appeared fresh; according to another, they did not. There was some conflicting evidence, lay and professional, on the question whether putrefaction could be so completely suspended during eight days as it had been in this instance. The counsel for the prisoner dwelt upon the absence of the process as a proof that death must have been

recent, and therefore that the prisoner could have had no share in it. The judge also inclined to this view. In addressing the jury he said, "It is difficult to suppose that a body at this or any season of the year could have remained that long without exhibiting some symptoms of putrescence. Connect also that in two or three days after it was found it did show such symptoms as in that time might naturally be expected.' Another singular point raised in the prisoner's favour (*vide* "Hair in Identity") was that the beard had grown after the discovery of the body, and it was quite short when it was first seen, and had the appearance of having been recently shaven; but in the interval of Tuesday and Thursday, after its discovery, it had become a little longer. Counsel contended that the beard will grow after death; and as, when the body was found, the chin was cleanly shaven, this pointed to recent, and not to remote, death, as the beard would have already become elongated when the body was found had the deceased been dead six days. The medical witnesses, in reference to this theory, stated that the appearance of growth after death was to be ascribed to a shrinking of the skin. The jury returned a verdict of guilty. The prisoner subsequently destroyed himself, and, while dying from his wounds, protested his innocence of this crime (Beck's "Med. Jur.," vol. 2, p. 45).

This case does not appear to present much difficulty. The fact that the body of the deceased remained six days in a sheltered spot during the month of November, without undergoing any of the usual changes from putrefaction, is consistent with death six days previously. When found the body had reached the third stage described by Devergie: it was cold and pliant, or readily became so; it had passed through the stage of cadaveric rigidity. According to the observations of Devergie, a dead body, *cæteris paribus*, would assume this condition in from three to eight days after death. The fact that putrefaction came on in two or three days after its discovery is fully explained by the high temperature to which the body was then exposed. The state of the beard did not justify the inference that death had been more recent. Neither the age nor the condition of the deceased's body is stated, but it is clear that he died suddenly from loss of blood, as well as other injuries. It may be inferred, therefore, that his muscular system was endowed with the ordinary amount of irritability. In cases of healthy persons suddenly killed by decapitation, Brown-Séquard observed that cadaveric rigidity did not appear until ten or twelve hours after death, and that it lasted more than a week when the weather was not extremely warm. The retardation of putrefaction in the above case may have been due to a similar cause.

The medical difficulty in the case of Desha arose chiefly from the suspension of the putrefactive process beyond the average period. Other cases have occurred in which the rapid access of putrefaction following sudden death has implicated persons in charges of murder, and they have narrowly escaped conviction, apparently because the changes produced by putrefaction had been mistaken for the effects of violence.

In 1842 Ellen Byrne was tried at the Commission Court, Dublin, for the murder of her husband by strangulation, suffocation, or other violence ("The Trial of Mrs. Ellen Byrne for the Murder of Mr. Augustine Byrne, specially reported by T. R. Dunckley," Dublin, 1842). The prisoner and the deceased, who were in a respectable condition of life, were in the habit of drinking to excess. On this occasion they had retired to their bedroom, and about four days after the deceased had been last seen alive and eight days after they had been in the room the body of the husband was found dead on the bed, while the wife was in the room. She professed not to know that her husband was dead, and sent for a medical man. From his evidence it appeared that when he first saw the body on the evening of July 9th it

was so much decomposed that he was led to believe the deceased had been dead at least four or five days. The face and neck were black, and decomposition had gone on to such a degree in these parts as to obliterate, it was believed, any marks of violence that might have been there at the time of death. The right eye was protruded, the tongue projected between the teeth to about half an inch, the ears were black, the lips swollen, and the fingers contracted. There was a frothy liquid issuing from the mouth and nostrils in bubbles, and living maggots were seen in these parts. The whole of the body was greatly swollen, discoloured, and passing rapidly into a state of decomposition. When first seen the deceased was lying on his face. There was a faint, heavy smell in the room. An inspection made the next day revealed the fact that putrefaction had taken place in all parts, but the head and neck were most decomposed. The black colour of the skin appeared to decline as it got down to the lower part of the neck. Internally the heart was empty, and the vessels of the brain were perfectly empty; the blood was fluid. Feculent matter had been discharged from the bowels before death.

There were two medical questions in this case on which the guilt of the prisoner rested: (1) When did the deceased die? and (2) Was death to be ascribed to violent or natural causes? On July 1st, eight days before his body was found, the deceased had retired to his bedroom with his wife, and during that time a large quantity of spirits had been taken to the room and consumed by him, by his wife, or by both together. On the 3rd the voice of the deceased was heard as if he and his wife were quarrelling. On the 4th they were not seen. On the 5th a manservant deposed that he was called upstairs by the deceased, who spoke to him, and gave him half a crown to fetch whisky. He then heard the deceased's voice, and saw his bare arm through the partly opened door; but, from the position in which he was placed, he could not see the whole of the deceased's body. After this date the deceased was neither seen nor heard. He was found dead on the evening of July 9th, his body being then in the highly decomposed state above described. On July 6th the prisoner left the bedroom for a short time, and closed the door. On the 7th and 8th she was seen at the door of the bedroom by a manservant, and on the latter day by her maidservant, and she was then quite sober, and spoke to them as usual. On the 9th, at 10 a.m., she ordered the servant to bring up *two* cups of tea. Between 6 and 8 p.m. on that day she suddenly called to one of her sons to turn the deceased on his back. On entering the bedroom he found the deceased dead, and the body as above described. As the prisoner had been in the bedroom alone with the deceased, either living or dead, from July 5th, when he was last seen, until the 9th, she must, it was alleged, have been cognisant of his death, if it had not been directly caused by some act on her part. The prisoner made two statements: first, that she slept in the bed on the 7th and 8th, and that the deceased died on the 8th. She subsequently stated that he died on the 9th, the day on which the body was discovered.

From the state of decomposition of the body, two of the medical witnesses for the prosecution assigned a period of at least four or five days during which deceased must have been dead. Two declined to give an opinion as to the number of days, but Geoghegan stated his belief that such changes might take place in from twenty-eight to thirty hours. A medical witness called for the defence deposed that he had seen a body as much decomposed twenty-four hours after death. On referring to cases elsewhere related, it will be perceived that the shorter period assigned by these two witnesses, one for the prosecution and the

other for the defence, is quite within the limits assigned by experience, although evidences of such rapid putrefaction are not common. In this case, however, it must be remembered that the dead body was shut up in a close room, at the hottest period of the year, and the circumstances were therefore most favourable to the process. Admitting that this was an exceptional instance of rapid decomposition, the changes described by the witnesses might have occurred within twenty hours of the time at which the body was discovered, thus carrying the death to the night of the 8th, at the time when prisoner was, according to her statement, in bed with the deceased.

The other question, as to the cause of death, gave rise to a conflict of opinion. On the one hand, it was alleged that the appearances in the body—*i.e.*, the black and decomposed condition of the head and neck compared with other parts, the protrusion of one eye from its socket, and the projection of the tongue between the lips—as well as the absence of any natural cause of death, were medical proofs that deceased had died by strangulation, and not by any disease or accident. On the other hand, it was asserted that the deceased might have been accidentally suffocated while helplessly intoxicated by falling with his mouth on the pillow, or that he might have been carried off by a sudden attack of apoplexy or epilepsy. The discoloration of the face, the protrusion of the eye and tongue, and the discharge of fæces, might be accounted for by his dying during a convulsive struggle; while the two supposed indications of strangling afforded by the eye and tongue might be simply the result of the advanced state of decomposition in which the body was found. All the witnesses were agreed that there were no marks on the neck to indicate death by strangulation; but this want of physical evidence was accounted for by some of them on the theory that all such marks would be completely obliterated by putrefaction. The heart contained no blood, the vessels of the brain were empty, and the blood in the body was fluid and dark-coloured. The state of the lungs is not mentioned, nor the condition of the larynx and air passages, so that it is left uncertain whether any mechanical cause of obstruction existed in these parts. The emptiness of the heart was adverse to the theory of death by strangulation (asphyxia), and was referred to the mechanical effect of the gases of putrefaction on the organ. The emptiness of the vessels of the brain was left unexplained. It was inferred by most of the witnesses for the prosecution that the marks of manual strangulation on the neck externally, and the usual appearances of asphyxia internally, had existed at the time of death, and that these appearances had been destroyed by putrefaction. Those who adopted this view contended that the protruded eye and tongue were conditions which had resulted from strangulation alone, and that they could not be produced nor removed by rapid putrefaction.

The alleged guilt of the prisoner rested chiefly on these two points. The facts showed, even allowing no more than twenty hours to have elapsed between death and the discovery of the body, that the prisoner must have been cognisant of the death; and, unless hopelessly insensible from drink, which appears to have been disproved by the evidence, she would, it was suggested, if innocent, have given an alarm. She ultimately called to her son, and no reason can be assigned why she did not call for assistance earlier. It was impossible to assume

that she was speculating on the rapid decomposition of the body, and watching for the stage when marks of violence would be obliterated. No motive could be assigned for the murder, nor for her remaining shut up in the same room with her husband, as was alleged, for four or five days. Under these circumstances, with the admission by some of the scientific witnesses that the protrusion of the eye and tongue might have been caused by putrefaction, the jury returned a verdict of not guilty. There was nothing to exclude the supposition that the deceased might have died in an epileptic fit, as a result of excessive drinking. In any case, it was obvious that the body had undergone rapid putrefaction. The greater decomposition observed in the head and neck might have arisen from the congestion of blood in the superficial vessels. As other causes besides manual violence may produce congestion of the head and neck, the blackening of these parts in a highly decomposed body furnished no medical evidence of homicide. The protrusion of the eye and tongue did not strengthen the theory of strangulation, since it was properly admitted by some of the medical witnesses that these conditions were consistent with the effects of putrefaction in an advanced stage. There was, therefore, no medical evidence to show that deceased had died by violence; and, instead of drawing the inference that such evidence had existed and had been destroyed by putrefaction, it would have been safer to have said that the highly decomposed state of the body prevented any correct medical opinion from being formed. No opinion went the length of affirming that death was necessarily produced by violence; and the jury were informed by the judge that they were not to convict the prisoner on probability, however strong, nor on a mere preponderance of medical opinion.

The medical evidence at this trial raised the question whether protrusion of the eye and tongue in a highly decomposed state of the head and neck should or should not be regarded as an absolute proof of homicidal violence applied to the neck. One of the scientific witnesses affirmed that these could not result from putrefaction. Another deposed that they might result from gaseous decomposition taking place in the orbit; the gases thus confined would cause a projection of the eye and its coverings, while, in reference to the tongue, the effect might be aided by the face being inclined downwards, and the mouth being partly open. The fact that only *one* eye was protruded is less reconcilable with the effect of mechanical pressure on the neck than with the theory that decomposition took place from effusion of blood or other causes more in one orbit than in the other. With regard to the tongue, whatever causes congestion of the head and neck is likely to cause congestion of this organ; and putrefaction, by the production of gas in its substance, may lead to its enlargement and protrusion.

It is strange that the protrusion of the eye as a result of putrefaction should have been doubted and even denied by some of the witnesses at this trial. So conflicting was the evidence regarding this appearance, that Geoghegan made it a subject of experiment on the dead body of a child, and he observed that the eyes protruded as a result of decomposition on the eighth day, and they began to present the appearance of protrusion on the fourth day. A case of rapid

putrefaction, in which both eyes protruded as early as sixteen hours after death, is reported (*Med. Gaz.*, January, 1850, p. 17). The time at which such an appearance may present itself after death must obviously depend on the period at which gaseous putrefaction takes place in the orbits. Although in the dead the eyes are usually collapsed owing to transudation of the fluids, yet it has been pointed out by Orfila that the lids may bulge forwards and the eyes protrude from the production of gases within the cranium and orbits.

In 1863 a trial took place involving questions almost identical with those which arose at the trial of Mrs. Byrne (*Reg.* v. *Mahaig*, Kingston Wint. Ass., 1863).

On this occasion the body of a woman was found dead in a room in an advanced state of putrefaction. The deceased and her lover, a soldier, had retired to a bedroom some days before, and had kept themselves there secluded; the soldier was found with his throat severely cut. This man was charged with the murder of the deceased by strangling her with a rope, and the medical questions to be solved were—How long had she been dead? and, Did she die from strangulation or any other cause? The author attended the inquest and the trial on the part of the Crown, having made an analysis of the stomach in order to determine whether poison was present therein. Taking the two questions in their order, it may be observed that the medical evidence showed that when the deceased was first discovered, on November 6th, at 6.30 a.m., she was lying on her back in bed, her body being covered with clothes as usual, the head and neck only being exposed. There was a pillow lying loosely over the face. There was no rigidity, and the hands were not clenched. The upper part of the body, including the head, neck, and shoulders, was very much decomposed. The skin of the face was so black that the features could not be distinguished. The tongue was protruded and swollen. The lips were everted and blown up with gas. Gases escaped from between the tongue and lips with a slight hissing sound. The abdomen was enormously distended with gas, and at the lower part much discoloured. On opening its cavity the intestines protruded. The liver was in a putrefied state. On cutting into the skin of the chest a large quantity of air escaped; the lungs were found collapsed, and the heart was empty and contracted. Owing to the putrefied condition of the body, the head was not examined. From the blackened and decomposed state of the upper part of the body, a medical witness formed the opinion that death had been caused by violence, and he inferred that deceased must have been dead for some time.

According to the evidence, the prisoner and deceased took the bedroom as a lodging at a public-house on November 3rd. The woman was seen on that night, about nine o'clock, as well as the following morning. On the last occasion the landlady, who took the breakfast to the door of the room, saw her face in bed. She was lying still, and, as she did not speak, the witness could not say whether she was then living or dead. It was observed, however, that of the breakfasts taken up, which had been ordered for two the previous evening, only one was eaten. From that time deceased was not seen alive. The prisoner came downstairs on November 5th at 9 a.m. There was nothing unusual in his appearance or manner. He asked to borrow a razor to shave himself, but there was no razor in the house. Breakfasts were not taken up that morning; and the following morning, as neither appeared, the room was entered, and the body of deceased was then found in the state described. The prisoner was lying on the bed with his throat severely cut; the wound had obviously been inflicted some hours, and had bled a great deal.

From the time when the deceased was last seen living about sixty hours had elapsed. Considering that the weather was close and damp,

and the body shut up in a small room, there was ample time for the putrefactive changes described to have taken place, although such a degree of putrefaction is rarely seen until after the lapse of three or four days in warm damp weather. It was therefore an exceptional instance of rapid decomposition, like those elsewhere described. As the prisoner alone was in the room with the deceased, he must have been cognisant of her death, and yet he gave no alarm. His statement was, that they had both resolved to die ; that they had purchased poison on the 3rd, and had taken it on the evening of that day; and that the deceased died in his arms. In the afternoon, having left the room for a short time, he found on his return a cord round her neck, which he removed. The highly decomposed condition of the body was consistent with his statements ; for although one day might be sufficient for such changes, they are seldom witnessed in less than two days. This would place the death of the deceased on the night of the 3rd.

The main question, however, was this :—Had the deceased been strangled by the prisoner on that night, or did she die from any other cause ? The putrefied condition of the body was consistent with either hypothesis, and it was a strong circumstance against him that he had remained in the room with the dead body. There was, however, an entire absence of motive for the alleged murder. The prisoner and the deceased had been apparently happy together. No quarrelling or struggling was heard at any time by the people of the house. There were no marks of violence on her person indicative of struggling or resistance. It was proved, as prisoner had stated, that the deceased had on November 3rd purchased at a druggist's, under a false pretence, a threepenny packet of Butler's vermin-killer. This contains about one grain of strychnine, mixed with soot and flour; and the paper wrapper of this packet, with the empty bag which had contained the poison, was found in the prisoner's possession. Several letters written by the prisoner, one apparently at the dictation or with the cognisance of deceased, referred to their mutual intention to destroy themselves; and another, dated November 4th, stated that the deceased had taken poison and had died in his arms. With these facts there was reason to believe that the deceased had really taken the poison which she herself had purchased, and had died from its effects. Assuming that muscular irritability had been exhausted by violent tetanic convulsions before death, and that the deceased had died in one of these convulsive fits, with great congestion of the head, the rapid putrefaction and the blackening of the features from the decomposed blood in the vessels would then be explained. The empty and contracted state of the heart was also consistent with this view. The stomach was examined chemically by the medical man who was first called in to see the deceased. He found it empty, containing only mucus with some black particles, the nature of which could not be defined. It was at first thought that it contained strychnine, but on making an analysis of the remainder of the stomach and the spirit in which it had been preserved the author found that it contained no strychnine, and that the chemical results which had led to this conclusion were owing to the colouring action of sulphuric acid on bichromate of potassium in contact with organic matter. In the state in which the stomach was brought, cut into two portions and macerated in spirit, it was impossible to determine

whether it had originally contained starch or soot (the substances with which the strychnine in the purchased powder was mixed), or gin (the liquid in which the prisoner said the deceased had taken the poison). This negative result did not show that the deceased could not have died from the effects of a small dose of strychnine (half a grain) such as would be contained in one half of the packet which she purchased; for such a quantity might have been removed by absorption, especially as the poison was taken on an empty stomach. The theory adopted by the medical men who examined the body was that deceased had probably taken strychnine, but that, before the poison had had time to operate fatally, she had been strangled by the prisoner by means of a rope placed round her neck. This, in their judgment, would account for the contracted and empty state of the heart and lungs (*vide* Section on "Rigor Mortis"); they assumed that, as the strychnine was in the system, it would prevent that accumulation of blood in these organs which is considered to be characteristic of death by asphyxia. Another suggestion was, that, assuming strychnine not to have been taken by deceased, the empty condition of the heart and lungs might be accounted for by the effect of gaseous putrefaction in the abdomen. A few ounces of bloody serum were found in the cavity of the chest, but no blood was present in the heart or great vessels connected with it.

As the head was not examined, and the internal appearances of the chest did not support the theory of death by strangulation, it was sought to establish this view by the external appearances. Here, however, the same difficulty arose as in the preceding case. The advanced state of decomposition in the head and neck rendered the medical conclusions, to say the least, unsafe. The facts relied upon to show that the deceased had died from strangulation were—(1) the black and decomposed state of the head and neck compared with other parts of the body; (2) certain marks found on the neck, at the upper part, and chiefly on the left side; (3) the peculiarly moist condition of the head and upper part of the neck, and the drier appearance of the lower part, near the chest; (4) the enormous distension of the head and the protrusion of the tongue between the lips.

The first and third reasons assigned indicate, not the cause of death, whether by violence, disease, or poison, but simply an advanced stage of putrefaction in a case in which death had taken place suddenly, and the conditions were favourable to this. The surgeon who first inspected the body found, on the day following its discovery, three marks on the neck corresponding to three similar marks at the back part. There was no abrasion of the cuticle in front, nor any indentation or depression, but at the back the cuticle was peeling off as the result of putrefaction, and serum exuded from it. On removing the integuments there was no appearance of escape or coagulation of blood beneath; and this is generally found in death from strangulation. The cellular tissue was much blown up with the gases of putrefaction. At the adjourned inquest before the coroner, while the facts were recent, the witness had thus described the appearances on the neck: "On the external surface of the neck there were two or three *indistinct* marks, most distinct on the left side. On removing the skin there was not the least escape of blood, but

here and there the muscular tissue was more discoloured than the remainder." Another witness, who saw the body twenty-four hours later, described the marks as consisting of two or three lines of dark discoloration. There were no signs of violence beneath the marks, but the structures were of a darker colour below. He further stated that there was much blood beneath the skin from the chin to the chest, and on the arms there were apple-green streaks from putrefaction in the course of the bloodvessels. The protrusion of the tongue was referred by both, not to putrefaction, but to mechanical pressure on the neck as a result of strangulation.

A long clothes-line was found in the room, under the bed. This was proved to belong to the landlady, who stated that it had been lying a long time in the room before it was let to the prisoner and deceased. On it was one small spot of coagulated blood, as if from a wound, and some long hairs of a female. When these were compared with some taken from deceased's head, there was found to be no resemblance. It was suggested for the prosecution that this rope had been employed by the prisoner as the instrument of murder.

The author's evidence on this part of the case, the cause of death, was to the effect that, as the deceased was not seen in the act of dying, any medical opinion on the cause of death must be speculative; that there was nothing inconsistent with death from strychnine as alleged by the prisoner, while there were no medical facts on which the hypothesis of death from strangulation could be safely based: the internal appearances, so far as they were observed, were more consistent with death from strychnine than with death from strangulation, a fact admitted by the two medical men who ascribed death to homicidal strangulation; that the non-detection of strychnine in the body was not inconsistent with the fact that a small but fatal dose had been taken by the deceased; that a rigid state of the limbs in a dead body would not be found where putrefaction had advanced to such a degree as in this case. Further, the external appearances did not prove that violence sufficient to cause death by strangulation had been applied to the neck of the deceased. The marks of discoloration on the neck, with the protrusion of the tongue, might have arisen from extreme putrefactive changes. Had they been produced by the application of a cord, such a degree of violence as would have caused the tongue to protrude would have produced indentation and depression of the soft parts of the neck, with an effusion of blood in the course of the depression and a ruffling or abrasion of the skin. There was no protrusion of the eyes; the tongue was not indented or bitten by the teeth, and the hands were not clenched as in death by violent strangulation.

It was suggested by counsel that strangulation might have been produced by other and less violent means than by the use of the rope, and the slight appearances thereby produced might have been obliterated by putrefaction. It was admitted that this might happen, but there were no medical facts on which such an opinion could be based. The appearances were all consistent with putrefaction in an advanced stage, without resorting to the assumption that any violence whatever, sufficient to cause death, had been done to the neck. In the defence it was urged that the prisoner and the deceased had agreed jointly to take away their own lives; this was proved by the letters and their

conduct. The deceased herself had purchased poison for this purpose, and had taken it, according to the prisoner's statement, on the evening of the day on which she procured it. Everything in the case was consistent with the theory of voluntary suicide and of an attempted suicide by the prisoner in a state of despair. The powder containing the poison had disappeared, while the paper bag in which it was sold remained.

In his charge to the jury, Pigott, B., observed that the great question for them to decide was whether the prisoner had any part in the death of the deceased. If they were of opinion that her death was caused by the rope and by his act, then their verdict must of course be "Wilful murder." If they thought that death was caused by poison, then they would have to consider whether the deceased took the poison without any participation on his part in aiding and abetting her act, and if she did, then they must acquit him. But if, in their judgment, the two agreed together to take poison, and took it together, and she died, and he survived, then their verdict must be also "Wilful murder." The jury adopted this view, and found that the prisoner was guilty as an accessory before the fact, *i.e.* that he was not guilty of murder by strangulation, but that he aided and abetted deceased in the voluntary act of self-murder.

The two medical men, while expressing their belief that death had been caused by strangulation, admitted in cross-examination that they would not swear that deceased had not died from strychnine or some other cause; and one of them stated that his reason for thinking that strychnine had not caused death was, that none could be detected in the body. It is obvious, however, that a person may take a dose of strychnine, and yet, by the act of another, die from strangulation before the poison has been wholly absorbed, or before a quantity sufficient to cause death has penetrated into the blood. The discovery of some portion of strychnine in the stomach would not prove that the deceased had not been strangled, and its non-discovery, therefore, could not be taken as a fact in favour of death from strangulation. In short, this form of violent death should be clearly and conclusively established by medical facts independently of the administration of poison. Here the cause of death was simply based on medical belief or probability, not on absolute certainty, which alone would justify a jury in coming to the conclusion that murder had been thus deliberately perpetrated. According to the prisoner's statement, the rope was really around the neck of the woman on the night of the 3rd, and he removed it. Assuming that the coloured marks on the neck arose from mechanical pressure, and not from putrefaction, it becomes a question whether the rope may not have been thus used by the deceased in attempting to strangle herself, or by the prisoner in aiding and abetting her in the attempt. Such a degree of pressure might be made on the part of the neck where those marks were found without causing death, and this would account for their presence without rendering it necessary to suppose that murder by strangulation had been actually perpetrated. The description does not convey the idea that it was impossible for deceased thus to have produced them, or that they could not have been produced without necessarily causing death; and thus there was nothing to support the hypothesis of murder but medical conjecture.

It was stated in evidence, by one of the medical men, that if strychnine had been taken, and death was subsequently caused by strangulation, this fact would account for the absence of the usual appearances of asphyxia in the heart and lungs, *i.e.* that strychnine would operate by producing a contracted and empty state of the heart. Some questions on this point were put by the judge, in answer to which the author stated that no case of this compound character had, so far as he knew, occurred or been recorded; but that on general medical principles, if, after taking poison, a person underwent strangulation, there was no reason, *quoad* the poison, why the usual appearances of strangulation should not be found in the heart and lungs. The poison being in the body, would not prevent the appearances which attend a sudden form of violent death; and although a contracted and empty state of the heart may be found in numerous cases besides death from strychnine, it is reasonable to infer that if the action of the poison had proceeded so far as to cause the emptiness and contraction of the organ, it had gone far enough to cause death, thus rendering it unnecessary to resort to any other hypothesis. From all the facts of this case, it is in the highest degree probable that deceased took a portion of the powder containing strychnine on the evening of November 3rd, and that she died from its effects in the course of the night; that when her body was found she had been dead more than two days; that the prisoner aided and abetted her in the act of self-murder; that he was cognisant of her death, and was for at least two days in the room with her dead body without giving any alarm or calling for assistance; that he may or may not have taken part of the powder, but that, in accordance with their mutually expressed intentions, he had attempted to destroy himself by inflicting a serious wound in his own throat. The wound was not of that slight nature which is observed in wounds self-inflicted for the purpose of concealing or masking crime. He had lost much blood, and was depressed and faint when found.

The editor would remark on this extraordinary case that later observations would not have entirely cleared away the difficulties unless, perhaps, it were by the greater certainty with which all quantities of strychnine can now be detected. The inquest emphasises the importance of committing observations to paper. The verdict would probably be the same now as it was then.

On or about March 22nd, 1891, an unmarried woman was delivered of a fœtus or male child which respired, but its live-birth was a matter of doubt. On that day she without doubt took the body from the house; and on May 29th following the remains were found loosely covered with dry stable manure beneath a mixen. Meantime the weather had been for the most part dry and cool. When found the body, besides extensive injuries to the head, presented the following appearances:—The abdomen was green, and the skin thereon was peeling in several places. The scrotum and penis, with the exception of the urethra, had disappeared; but the remains of the testicles were found. It was at first surmised that the child had been dead not more than a week, but Dr. Stovenson was of opinion that it might have been dead seven weeks; and the woman was convicted of concealment of birth (*Reg.* v. *Pile*, Maidstone Sum. Ass., 1891).

These cases will serve to show that the changes produced by putrefaction in a dead body may often involve questions of life and death, and that they require more attention from the medical profession than

they have hitherto received. In alleged child-murder it has been generally considered that a highly putrefied state of the lungs prevents a correct medical opinion being formed of their actual condition at birth; and there are few who would venture to infer from experiments on such lungs that a child had breathed after its birth. In reference to poisoning, when in any suspected case the mucous membrane of the stomach and bowels has undergone extensive changes from putrefaction, it would be unsafe to rely upon the appearances as evidence of death from poison, although they might at first sight resemble those produced by irritants. The same caution should be observed in forming an opinion from the state of the skin when putrefaction is far advanced. The discolorations which here take place, especially in parts of the body in which the venous trunks and capillaries are congested from any cause at the time of death, are liable to deceive the examiner when death is attributed to violence, and he is searching for proofs of this. In another place several cases of this description are quoted, and in one, according to the statement of Christison, a man appears to have been wrongly convicted of murder by strangulation chiefly because a broad blue mark was found in the front of the neck of the deceased. This was at first attributed to violence. There seems, however, to have been little doubt that it was due to post-mortem changes in the body.

Putrefaction, unless advanced to the last stage, cannot entirely destroy marks of violence when attended by physical injury to parts, such as abrasions or lacerations of the skin, laceration or crushing of the muscles with fracture of the trachea or larynx, protrusion of the tongue, accompanied by marks of indentation or laceration by the teeth. In such cases, a safe medical opinion may be formed in spite of the decomposed state of parts; but it is otherwise with superficial marks unattended with mechanical injury. These are precisely the appearances which occasion mistakes, as they may be really due to post-mortem changes, and not to violence. It is true that life may be destroyed by a slight degree of mechanical pressure, and the injury thus occasioned may be masked or obliterated by putrefaction. There is, however, this conclusion to be drawn: it is far better that a few cases of real homicidal violence should thus escape recognition than that we should incur the serious risk of involving an innocent person in a charge which on conviction might lead to capital punishment. Murder by strangulation is murder in its worst and most aggravated form. The act itself implies malice and deliberate design. If the body is not decomposed, we may act safely; if decomposition has advanced to a great degree, whether generally or locally, it would be unsafe to base an opinion on superficial discolorations.

5. Deductions from Putrefaction as to how long a Body has been in Water.

Some attempts have been made to generalise on the phenomena of putrefaction in water in order to enable us to say for how long a period a body may have been immersed. No satisfactory data, however, have been obtained to guide us in this inquiry. The changes which take place are modified in their degree and the rapidity of their progress by numerous and often inappreciable causes. Devergie believed that he

had obtained a certain series of characters whereby he could determine with sufficient precision the length of time which a dead body may have been in the water, supposing the drowning to have occurred during the winter season. Thus, according to him, in bodies immersed *from three to five days* we shall find :—Cadaveric rigidity ; coldness of the surface ; no contraction of the muscles under the galvanic stimulus ; and a white or sodden appearance of the skin of the hands. From *four to eight days :*—Pliancy of all parts of the body ; no muscular contractions under the galvanic stimulus ; natural colour of the skin ; cuticle of the palms of the hands very white. From *eight to twelve days :*—The whole of the body flaccid ; the cuticle of the back of the hands beginning to whiten ; the skin of the face softened and pallid, differing from the skin of other parts of the body. About *fifteen days :*—The face somewhat bloated and covered with red patches ; a greenish tint in the middle of the sternum ; the cuticle of the hands and feet perfectly white, and becoming raised in folds. About *a month :*—Face of a reddish brown colour; eyelids and lips green ; a reddish brown patch surrounded by a green border on the fore part of the chest ; the cuticle of the hands and feet white, thickened, and corrugated. About *two months :*—Face brownish-coloured and swollen ; the hair becoming loose ; the cuticle of the hands and feet in great part detached ; the nails still adherent. *Two months and a half :*—Cuticle and nails of the fingers detached ; that of the feet the same, but the nails still adherent. In the female there is a reddish colour of the subcutaneous cellular tissue in the cervical region, as well as that which surrounds the windpipe and the organs contained in the chest ; partial saponification of the cheeks and chin, superficial in the breasts, groins, and fore part of the thighs. *Three months and a half :*—Destruction of part of the scalp, eyelids, and nose ; partial saponification of the face and of the upper part of the neck and groins ; destruction of the skin in different parts of the body ; cuticle of the hands and feet as well as the nails entirely detached. *Four months and a half :*—Almost complete saponification of the fatty part of the face, neck, groins, and fore part of the thighs ; the appearance of a calcareous incrustation or deposit on the thighs ; incipient saponification of the fore part of the brain ; opalescent condition of nearly the whole of the skin ; destruction and removal of the hairy scalp ; the bones of the skull laid bare and beginning to become brittle. There are no data to give even approximate opinions for a longer period than this ; and it is admitted that even these imperfect data are not available for determining the period of death in subjects drowned during spring and summer.

There is a common belief that the dead human body is soon destroyed by submersion in water ; but this is not borne out by experience. In those who are drowned during winter, and whose bodies remain long below the surface, or are covered with mud so as to prevent a free access of air, decomposition takes place slowly.

Eager, of Guildford, met with a case in which a man, æt. 70, was missing from January 6th to February 4th, 1864. His body was found in a river, and there was reason to believe that he fell in and was drowned on the day he was last seen. The head, neck, and a portion of the chest, where unprotected by clothing, were thickly covered with mud. When this was removed, the features were perfectly recognisable, and although twenty-eight days had elapsed, identification was easy. The only changes observed were as follows :—The cuticle peeled away from the cutis when slight

friction or pressure was made over those parts which had been covered with mud. The face and neck were somewhat darkened in colour, and the front part of the chest was marked with slight lines of lividity. There was no tumefaction whatever over any part of the body. The thickened skin of the hands and feet was corrugated and whitened by long-continued maceration, but remained firmly adherent to the tissues beneath it. With these exceptions, the body presented no appreciable alteration of appearance, nor any departure from that which would be observed in a recently dead body.

In 1857 some parts of the body of an infant were found floating on the surface of water in a pit. There was the skull with the sodden skin upon it, but the brain, eyes, and ears had disappeared. The upper part of the chest and one arm were found. The soft parts appeared to enclose the bones, which were quite loose and discoloured, but saturated with water. Some of the articular cartilages were still attached, although very much softened and easily separated. There were the remains of a woollen cloth in which the body was probably wrapped. It had been kept at the bottom of the water for some time by a heavy stone found there, which was no doubt attached to the body.

Upon these facts the questions submitted to the author in reference to a woman delivered of a child eighteen months previously, and suspected of murder, were whether it was possible that a human body could remain so long a time as eighteen months in water without being totally destroyed, further whether the action of water would not increase the bulk of the body, so as to make a new-born child appear some weeks old. The answers to these questions were—(1) that a dead human body submerged is not necessarily destroyed in eighteen months: and, in reference to this case, it appears probable from the description that the body had been immersed for a longer period; (2) that in the early stages of gaseous putrefaction the body may appear larger from general distension, but this stage had been long passed in reference to these remains. Although this was probably a case of infanticide, there were no data to determine whether the child had been placed in the water living or dead.

Harris, of Redruth, met with a remarkable instance of the effects of water on the human body after submersion for the long period of twenty-six years:—

In 1828 a healthy muscular man, æt. 24, fell into the shaft of a mine, fifty fathoms deep, of which thirty fathoms consisted of water. The efforts to recover the body were unsuccessful. The shaft was closed over, and so it remained until April, 1854, when the working of the mine was resumed. The skeleton of the missing miner, with portions of the clothes which he wore, was discovered in one of the levels, in which there was water. The remains, as well as the clothes, buttons, and boots found on the skeleton, were identified by his brother. All the soft parts, with the exception of a small piece of fatty substance, were destroyed, but the bones were firm and well preserved. There was no muscle, tendon, ligament, or even cartilage about any of them. They were all detached from the joints, and were of a dirty brownish or almost black colour. The skull was full of a brown soft substance, which was without smell. There was nothing in the water calculated either to destroy the soft parts or preserve the bones.

It is not often that a precise opinion is required of a medical witness respecting the probable period at which death has taken place from drowning (*vide* "Drowning" for further reference).

6. Effects of Disease, Poison, or Violence *v.* Post-mortem Changes or Decomposition.

Some of these have already been incidentally mentioned in the systematic description of post-mortem changes:—

Bruises *v.* Hypostases, p. 260.

Hypostasis *v.* Inflammation, p. 259, also *infra*.

There are, however, one or two others which must be attended to.

Post-mortem Changes *v.* Poisoning.—During these changes in dead bodies various discolorations take place on the mucous surface of the stomach and bowels, often closely simulating the effects of poison. The mucous membrane of the stomach may be found of various tints, from a red-brown, becoming of a brighter red by exposure to the air, to a deep livid purple or slate colour, and sometimes black from a decomposition of the blood. At the points where the stomach is in contact with the spleen or liver the lividity is often well marked and clearly defined through all the coats. The peritoneal or outer coat is of a greenish hue, and the course of the superficial vessels is marked by greenish brown or black lines. These spontaneous changes, which are the result of putrefaction, may be easily mistaken for the effects of irritant poisoning. There are no rules that will always enable a medical jurist to distinguish such cases. Much must depend on the progress of putrefaction and the period after death at which the body is examined. Hence each case must be judged by the circumstances which attend it. We may presume that the redness has taken place during life, and is not a result of post-mortem changes, —(1) when it is seen soon after death; (2) when it is met with in parts not dependent, nor in contact with other organs gorged with blood; (3) when it is accompanied by a considerable effusion of coagulated blood, mucus, or flakes of membrane, the result of ulceration, corrosion, or destruction of the coats of the viscera; (4) if decomposition has not advanced too far, an effort may be made to strip off the mucous membrane of the stomach; if it separates readily, this is suggestive of irritant poison. When the body is not inspected until a long period after death it is difficult to distinguish these pseudo-morbid appearances from those depending on the action of irritant poison. In a really doubtful case it is therefore better to withhold an opinion than to express one which must be purely conjectural.

It must be remembered that the *contents* may be of more importance than the condition of the stomach. Moreover, if these contents are of a mineral irritant character, it is practically certain that they will not have disappeared, nor are gross (bits of leaves, berries, flowers, etc.) vegetable irritants likely to have passed beyond recognition, though naturally liquid preparations of vegetables, or even of minerals, may have done so.

It is impossible to assign a definite time at which the effects produced by irritant poisons are destroyed by the process of putrefaction. If the poison were of an antiseptic character, and the body had been speedily buried, a decided redness of the stomach, as a result of inflammation, may be perceived after five or six weeks. On one occasion the effects of arsenic on the mucous membrane of the stomach were distinguishable in the case of a child whose body had been interred for a period of twenty-eight days, and in two other cases, in which the viscera were well preserved, they were so after a year and nineteen months respectively. Of course, when the inflammation is only slight, its results will be much more speedily obliterated, or merge in the redness caused by decomposition.

The mucous membrane of the stomach and upper part of the small intestines often presents during putrefaction a yellowish or green

tinge, depending on the transudation of the bile, or the colouring matter of the faeces contained in the colon. This must not be mistaken for the appearance of poisoning by the mineral acids. There is, in these cases, no softening or corrosion, and the throat and gullet are not implicated, as they are in this form of poisoning. So, again, melanosis in the stomach—*i.e.*, a deposit of black colouring matter beneath the mucous coat—might be mistaken for the effect of sulphuric or oxalic acid or caustic alkalies; but melanosis is unaccompanied by any marks of inflammation, corrosion, or destruction in the mucous membrane beneath, and it is always seen in well-defined spots.

Post-mortem Digestion of Stomach *v.* Disease.—Post-mortem digestion of the stomach is not a very common phenomenon. The editor (F. J. S.) has only met with it about a dozen times in several thousand post-mortem examinations. He has noticed it almost entirely in young subjects. The exact cause why the stomach is sometimes autodigested and sometimes not is not at all clear. *A priori* one would expect autodigestion in those cases where the stomach was healthy and actively digesting when death took place, but experience in the post-mortem room has shown that such is by no means invariably the case, for he has found it in most unaccountable cases of lingering disease, and has failed to find it in many cases of accidental sudden death. Whatever its precise cause, the following differences hold in the appearances produced by digestion and by ulcer or inflammation: —

In Ulcer or Inflammation.	*In Digestion.*
(*a*) The edges are rather abrupt, and the margins invariably slightly thickened, or at least not thinned.	(*a*) The edges are not abrupt, and the margins are invariably thinned, thinner than the rest of the healthy stomach.
(*b*) The mucous membrane can be peeled off the stomach up to or from the edges of the solution of continuity.	(*b*) The mucous membrane cannot be so peeled; it is soft and pulpy.
(*c*) The muscle in the edge of the ulcer or below the inflamed part is less affected than the mucous membrane.	(*c*) The muscle is as much digested as the mucous membrane, and equally soft and slimy.
(*d*) Possible presence of adhesions between stomach and other viscera, or of pus and other evidence of inflammation in peritoneum.	(*d*) No trace of adhesions nor of inflammatory signs or results.

SECTION VI.

PRESUMPTION OF DEATH.

Inasmuch as a person who has been presumed to be dead might possibly reappear and require identification, there is a certain propriety in discussing this subject next to that of identity and death, though strict *medical* testimony is but little involved in deciding the cases.

The cases quoted below show the necessity of some presumption of death for the following reasons :—

1. To prove that a girl of sixteen died unmarried and without issue (*Watson* v. *England*).
2. To prove a woman was a widow (*Church* v. *Smith*).
3. To defend a charge of bigamy (*Reg.* v. *Briggs*).
4. To obtain a legacy (*Re W. Beasney* and case of Davy, also *Green* v. *Green*).
5. To obtain insurance money (*Hiorns and Drew* v. *Railway Passengers' Assurance Co.*).

Presumption of Life ceases in Seven Years.—The death of any person once shown to have been alive is a matter of fact to be determined by a jury; and when the body is not forthcoming, as the legal presumption is in favour of the continuance of life, the onus of proving the death lies on the party who asserts it (Best, "Presumptions of Law and Fact"). When a person goes abroad and has not been heard of for a long time, the presumption of the continuance of life ceases at the expiration of seven years from the period at which he was last heard of. The same rule holds generally with respect to a person who has gone away from his usual place of resort, and of whom no account can be given, but the presumption does not extend to the *time* of his death, *i.e.*, whether he died at the beginning or at the end of any particular period of the seven years.

If any person for any purpose contends that the individual was, as a matter of fact, alive upon any one given day in those seven years, it is incumbent upon such person to prove that fact by positive evidence. This ruling, which still holds good, has a very important bearing on survivorship (*vide infra*, case of *Lewis's Trusts* and others).

In the case of *Watson* v. *England*, which came before the Court of Chancery, it was attempted to enforce as a presumption that a female, who had left her father's house in 1810, and had not been heard of for thirty-four years, was dead. No decision was come to, the Vice-Chancellor observing, from the great uncertainty of the evidence, that if he presumed her death, the woman might walk into court and disprove all. In one case, according to Best, the Court of Queen's Bench said that they could not assume judicially that a person alive in the year 1034 was not alive in 1827 (*op. cit.*). Without adopting this extreme legal view of possible longevity,

it is obvious that courts of law may be easily deceived if such presumptions are admitted too readily. In *Church* v. *Smith* (Exch., December, 1853), the question was whether plaintiff was then a married woman, or whether, by reason of the long absence of her husband, his death might not be legally presumed, and that she was, therefore, a widow, and could sue in her own right. According to the statement of her counsel, she was married to a man who had deserted her fourteen years ago, and she had heard nothing of him during the last twelve years. An end was put to the case by the appearance in the witness-box of an aged man who turned out to be the missing husband. The plaintiff, therefore, not having the power to sue in her own right as a widow, was nonsuited, the Chief Baron observing to the jury that he should have directed them to presume that the husband was dead, if, as the counsel stated, it had been proved that he had not been heard of for twelve years; but, after his appearance in court, he could not ask them to presume a man to be dead who was actually living before their eyes. In *Reg.* v. *Briggs* (November, 1856), a woman was deserted by her husband four months after marriage, and he had been absent from her seven years. The woman married again in her maiden name; and on an indictment for bigamy it was contended in her favour that the husband had been absent for the period above mentioned, and the prisoner had no knowledge of his existence. She was convicted, but the conviction was quashed on appeal. In a case before Malins, V.-C. (*Re W. Beasney*, January, 1869), the person whose death was in question was last seen in August, 1860. He was then suffering from pulmonary disease, and was much emaciated. He announced his intention to go to New York, but to return before October. He was never afterwards heard of. The petitioner was entitled to the principal of the legacy in the event of the death of W. Beasney before November 7th, 1860, and contended that he must be presumed to have died before that day, as, although in needy circumstances, he had not applied for the dividends then due to him, and when last seen he was in a precarious condition of health. On the other side it was asserted that the onus of proof was on the petitioner, and no proof of death had been given. The Vice-Chancellor decided in favour of the petitioner that Beasney died before November 7th, 1860, chiefly on the ground that he had punctually applied for and received the dividends on an annuity up to the time of his disappearance. None had been applied for since that time, and ten years had elapsed.

Great injustice would be done unless some rule were adopted regarding the disposition of the property of those who have been long absent, and not heard of for many years.

In the case of Davy (Probate Court, 1858), it was proved that the testator was a master mariner. He made his will on December 2nd, 1856, and sailed for Melbourne from Southampton in December of that year. He then made a voyage to Calcutta, where he arrived in October, 1857, and in the following December cleared from Calcutta for Port Louis, in the Mauritius. His vessel never arrived at her destination, and nothing had been heard of her since that date. The correspondent of the owners of the vessel at the Mauritius had, from time to time, reported her non-arrival. This was considered sufficient to establish a presumption of his death, although not more than two years had elapsed since his departure from England; and probate of the will was granted..

In *Green* v. *Green* (Vice-Chancellor's Court, July, 1861), a question was raised whether a person who had not been heard of for upwards of eighteen years must be presumed to have died. The testator in the cause, who died in August, 1838, by his will, dated in April, 1838, gave an annuity of 30*l.* to his son, James Green, and upon the death of such son the testator gave 750*l.* to the children of Jas. Green, and if he should die without leaving children, then the testator gave such sum of 750*l.* to the brothers and sisters of Jas. Green who should be living at his (Jas. Green's) death. In September, 1840, Jas. Green left this country for New South Wales, and he had not been heard of since February 1st, 1843, when he wrote a letter acknowledging the receipt of the last payment of the annuity of 30*l.* Edward Green, one of the brothers of Jas. Green, died on January 24th, 1846, and the question was, whether the absent Jas. Green must be presumed to have died before or after his brother Ed. Green. On the former presumption Ed. Green's representatives would be entitled to a share of the 750*l.*; and on the latter presumption they would not be so entitled. The bill was filed by one of the children of the testator, who was interested in the presumption that Jas. Green had

died after his brother Edward, and in that state of circumstances the Vice-Chancellor ruled that the burden lay on the plaintiff to show that James was alive at the death of his brother Edward. As above stated, there was nothing to show that Jas. Green had been heard of since February 1st, 1843. A decree was made to the effect that Jas. Green must be presumed to have died before Ed. Green, and that the fund should be distributed upon that presumption.

A remarkable case was tried in the Court of Exchequer in February, 1862 (*Hiorns and Drew* v. *The Rail. Pass. Insur. Comp.*), which involved a question of the presumption of death from circumstantial evidence, but in which it was suggested that a fraud had been perpetrated by the parties concerned. The action was to recover from defendants the sum of 250*l.* on a policy of insurance on the life of one F. D. Hiorns. The alleged deceased, Hiorns, was a single man, æt. 26. He insured his life against accident for the above-mentioned sum on September 6th, 1856; and on September 13th he went to Brighton by an evening train, taking a return ticket. He spent the 14th and 15th with his friends, and on the morning of the latter day he had a bath in the sea; in the evening he parted from his friends, at about seven o'clock, to go to his lodgings before returning to London, expressing his intention of taking a second bath before doing so. He was seen to go towards the sea, and from that time up to the date of the action he had not been seen alive. On the day that he was missing a person discovered a suit of clothes lying on the top of the steps of a bathing-machine, but no trace of the owner of them could be discovered. The police took possession of the clothes, and upon searching the pockets a purse, containing a return-ticket, was found, and they were identified as belonging to Hiorns. Advertisements were issued, and every inquiry made to discover the missing man, but without avail. On October 30th, forty-five days after the disappearance of Hiorns from Brighton, the naked body of a man was washed up at Walton-on-the-Naze, on the Essex coast, about 150 or 160 miles from Brighton. The body, according to the opinion of some medical men, had been in the water some six or seven weeks, and it was, of course, very much decomposed, all traces of the features being destroyed. An inquest was held, at which the plaintiff, G. B. Hiorns, attended, giving evidence that the remains were, to the best of his belief, those of his brother. In consequence of the complete destruction of the features, according to the medical evidence, there was nothing whatever on which to base a proof of identity, and the jury found that it was the body of a person unknown. The defence to the action was that the assured was still living and within reach of his friends, awaiting the receipt of the money from the office. It seems that the alleged deceased had been a bankrupt in 1855; and in September, 1856, he effected several policies of insurance in different offices, and made his will, directing that the policies after his death should be realised, and the money appropriated to the payment of his debts. The jury could not agree, and were discharged without a verdict.

As in this case the body of Hiorns was not found, there was no direct proof of death. The discovery of the clothes was only a circumstance from which a presumption might be raised either way. Considering that the man's life had been insured in this and other offices for only one week at the time of this mysterious disappearance, there was strong reason for suspicion.

In 1878 a similar case occurred at Barmouth, North Wales. A gentleman left his hotel before breakfast ostensibly for the purpose of bathing. He was missed; and his clothes, with his watch and some money, were discovered on the shore; but the body was not discovered. On the strength of these facts, an insurance on the life of the missing gentleman was paid. Some months subsequently he was challenged by a friend who met him in South America. He had been in pecuniary difficulties; had absconded; and, to avert suspicion, left his clothes and other personal effects on the shore, having taken out with him an extra suit of clothes.

In September, 1866, a merchant of Bordeaux, named Vital Douat, who had become bankrupt, endeavoured, in collusion with his wife, to defraud an insurance company of Paris. Shortly before his bankruptcy he insured his life for 100,000 francs. He was subsequently declared a fraudulent bankrupt, when he suddenly disappeared, and about a month afterwards his wife presented to the office a certificate purporting to be a copy of the register of the death and burial of her husband

in England, and claimed the amount for which his life had been insured. A full investigation in this country led to the discovery that the man had passed under various names; had purchased a coffin; procured a certificate from a registrar of deaths, recording his own death in a circumstantial manner; and had followed to the grave in a churchyard in Essex the coffin which was supposed to contain the body of himself, the missing bankrupt. The coffin was exhumed. It contained only a mass of lead, evidently placed there to give it weight. The man fled the country, but was subsequently captured at Antwerp and delivered to the French authorities. The possibility of such a case as this occurring shows that our system of registration of deaths is sometimes fallacious. It is known that a wrong cause of death may be assigned by an ignorant or interested person, but this and some other cases prove that a living person may register himself as dead, and a fraudulent use be made of the certificate thus procured.

It is obvious that such cases can be elucidated by medical evidence only when it is proved that the missing party was labouring under some serious disease, likely to prove fatal, for which he may have received medical advice; an opinion might then be required as to the degree to which the disease had advanced, and the probability of its causing death within a certain period. No general rules can be laid down; every case must rest upon the circumstances which accompany it.

A presumption of death may arise in a question of life assurance, as when, for instance, the amount of a policy is made payable on the death of a person. He may have sailed in a ship which has not been heard of for many years; and from circumstances it may appear to have been overtaken by a storm in which other ships were lost. In such cases payment is commonly made under a deed of indemnity. If the case be disputed, the presumption of death is left as a question for the jury. A verdict was returned for the plaintiffs in an action to recover a sum insured on the life of a Mr. Macleane, the evidence being that about November 28th, 1777, the insured sailed from the Cape in a small sloop, and was never heard of afterwards. Several vessels of a stronger build sailed at the same time, and they encountered a violent storm in January, 1778, in which it was supposed the sloop was lost. It is clear that, unless a presumption of death were allowed in such cases, injustice would be done to the representatives of persons who had insured their lives.

Cases of presumption of death are not very rare. Within a period of about eight months the editor has noticed the following cases :—

On December 21st, 1903, Mr. Justice Bucknill gave leave to presume the death of Robert George Collier Proctor, who was the assistant librarian at the British Museum. On August 29th Mr. Proctor left England for a holiday in the Tyrol, and on September 5th he set out upon a dangerous excursion. Since then he had not been seen. Counsel, in making the application, explained that it was no use looking for the body, as there had been a heavy fall of snow. The estate of the deceased consisted of a valuable library, and also a reversionary interest in property which he would come into on the death of his mother, and which would amount to 6,500*l.*

A little later in the Probate Court, before Mr. Justice Barnes, leave was asked to presume the death of Mrs. Julia Costelow. It was stated that the lady was the wife of a bank clerk, and was married in August of last year. On the return from the honeymoon she and her husband lived together at Wandsworth, and on August 27th the husband left to go to work as usual. On his return in the evening he found his wife missing, and inquiries elicited the fact that she had been seen on board the steamship *Henrietta*, bound from Dover to Ostend. She appeared to be very excited, and a gentleman, thinking he saw a lady sitting upon the deck, went to the spot, but found only a hat and an umbrella.

Mr. Justice Barnes: Did he mistake the hat and umbrella for a lady?

Counsel: That is what he says. No trace had since been discovered of the lady, but the hat and umbrella had been identified as belonging to Mrs. Costelow.

His Lordship gave leave to presume the death on or since August 27th.

On April 12th, 1904, a case of a somewhat different nature was dealt with.

In the City of London Court an exceptional matter came up for decision. The life of Mr. James Ballard, 44, Siddals Road, Derby, was insured in the National Mutual Life Insurance Company for 100*l.* twenty-four years ago, payable at fifty years of age, and that period had now arrived. The policy was effected for the benefit of the assured's wife and children before his marriage. There were no children, and Mr. Ballard now applied that the money should be paid to him because in 1887 his wife left home and had never since been heard of. He asked the court to presume his wife's death, as was generally done in such cases where a wife had not been heard of for seven years.

Judge Lumley Smith, K.C., did not know why he should presume that a young woman under fifty was dead just because she left her husband, although it was seventeen years ago. When a woman left her husband she probably changed her name.

Mr. Gutteridge, counsel for the applicant, said that the lady had been advertised for, and inquiries had been made through the Salvation Army, who had throughout the country, as well as in Europe and America, extremely efficient means for tracing missing people.

Judge Lumley Smith did not think it followed that, because a woman left her husband, she had joined the Salvation Army. A trustee would be appointed, after certain formalities had been gone through, to receive the money from the insurance company, but the trustee would have to decide what he would do in view of the possibility of the wife turning up again. If the trustee paid the 100*l.* to the husband he might have to pay it again to the wife.

The following, from the *Times* of June 24th, 1904, is worth inserting:—

PROBATE, DIVORCE, AND ADMIRALTY DIVISION (BEFORE THE RIGHT HON. SIR FRANCIS JEUNE, PRESIDENT).

In the Goods of Samuel P. Hearn, presumed deceased.

This was a motion for leave to swear death, and for a grant of letters of administration *cum testamento annexo*.

Mr. J. Harvey Murphy said that Captain Samuel Partridge Hearn was master of the good ship *Martaban*, owned by the British and Eastern Shipping Company, of Liverpool. He sailed from Cardiff on March 31st, 1903, for Cape Town, and, having discharged his cargo there, proceeded on July 11th to Pekalongan, in Java, where he shipped a cargo of sugar for Barbados. On September 6th he wrote a letter to his wife enclosing his will, which he had executed on that day in presence of the ship's carpenter and steward. On September 12th he sailed from Pekalongan, and passed Aujer on September 21st, since which date the *Martaban* had not been heard of; and she was believed to have foundered off the Cape during a cyclone which raged in those latitudes during the month of October. The *Martaban* had been posted as missing at Lloyd's, and the underwriters had paid as for a "total loss." Captain Hearn's death had also been recorded in the "General Register and Record of Shipping and Seamen," under the provisions of sect. 255 of the Merchant Shipping Act, 1894. With regard to the will, which did not contain a formal attestation clause nor appoint any executor, it was submitted that it came within the provisions of sect. 11 of the Wills Act, 1837, and was entitled to be admitted to probate as "the will of a mariner or seaman 'being at sea.'" Counsel referred to *In the Goods of McMurdo* (1 P. and D. 540); *In the Goods of Lay* (2 Curt. 375); *In the Goods of Milligan* (2 Robert, 108); *In the Goods of Parker* (2 Sw. and Tr. 375); *In the Goods of Austen* (2 Robert, 611). In the case of *Morrell* v. *Morrell* (1 Hagg. 51) it had been held that the statute 29 Car. II. c. 3, s. 23, applied to "merchant" seamen. Captain Hearn was insured in the United Kingdom Temperance and General Provident Institution, who had been served with notice of this

application and did not oppose. Captain Hearn was on the best of terms with his wife, and in the letter he wrote her enclosing the will he told her that if she married again "the next fellow will have to have a tussle for you in the next world with me."

The President, having perused the affidavits, gave leave to swear the death on or since September 12th, 1903. The application for a grant would be dealt with at the Registry.

The next shows the need for caution in presuming death. It was heard after the case above, before Sir F. Jeune, on the same day :—

In the Goods of Ellen Cook, presumed deceased.

This was a motion to rescind an order made on March 28th, 1904, for leave to presume the death of Ellen Cook.

Mr. Barnard said that on March 28th, 1904, leave to presume the death of Ellen Cook had been granted. The motion had been reported in the press, and had thus been brought to the notice of Mrs. Ellen Cook, who, since her disappearance twenty years ago, had been married again to a man named Atherley, and had been living at Upper Sutton Street, Aston Manor, Birmingham. Mrs. Atherley communicated with Messrs. Goody & Sons, of Colchester, the solicitors in the application of March 28th. She had subsequently been identified by her niece, Mrs. Thomas Beck, and by a Mrs. Olive Beck. No grant had been made under the order, as the fact that Mrs. Atherley was alive had been ascertained before there was time for such grant to be made.

The President, having perused the affidavits, said that he was satisfied as to the identity of Mrs. Atherley, and accordingly rescinded the order of March 28th, 1904.

Presumption of Survivorship.—In this particularly difficult subject the English law draws a subtle distinction between *presumption by law*, where no evidence on either side is available, and *presumption by a jury*, before which evidence has been produced.

The difficulty of the subject and its fruitfulness in litigation lies in the fact that the law cannot, and does not attempt to, define what constitutes evidence until it has heard what it is that the parties concerned consider evidence, which may be of any degree of plausibility from definite fact that one person was seen alive after another was presumed to be dead, down to medical evidence only, as to the probability of one person from circumstances of age, sex, strength, etc., being able to resist adverse influences longer than another. Hence it by no means follows that because there is no evidence worthy of the name there will be no litigation, though such cases are usually either compromised or decided on fairly well understood principles amounting to the *status quo ante*.

The remarks made by Best, although published some years ago, embrace the whole subject by anticipation. He says :—"The true conclusion seems to be that the law of England recognises no *artificial* presumption in cases of this nature, but leaves the real or supposed superior strength of the parties perishing by a common calamity to its natural weight, as a *circumstance* proper to be taken into consideration by a jury or judge called on to determine the question of survivorship, but which *circumstance*, standing alone, is insufficient to shift the burden of proof. If, therefore, the party who, by laying claim to property on the ground of the survivorship of one individual over another, takes upon himself the onus of proving *that* survivorship, has no further evidence than the assumption that, from age or sex, one party struggled longer against their common death than his companion, it seems that no decree would be made in favour of a claim. But, on the other

hand, it is not quite correct to say that the law *presumes* both to have perished at the same moment. This would be to establish an artificial presumption against manifest probability, although the practical consequence is in many cases the same, because if the party on whom the onus lies cannot show affirmatively who died first the question will necessarily be treated by the tribunal as a thing from its nature unascertainable, and that, for all that appears to the contrary, both died at the same moment" (*op. cit.*, p. 201).

We must, however, for the sake of clearness in exposition, consider the two classes as separately as we can, though the distinction will be found to hardly hold in reading the cases decided.

Condition I.—Cases where no Evidence is Available.

Under these circumstances the old Roman law has had great influence upon the decisions of our English courts. This law was in effect, "*When there was no evidence to show which of two or more persons died first the law would not presume that one died before the other.*"

The English law has, however, allowed, and does allow, certain exceptions to this rule. Thus—

1. When a parent and child perish by a common accident the child is presumed—

(*a*) If above the age of puberty to have survived its parent;

(*b*) If below the age of puberty to have predeceased its parent.

2. When husband and wife perish by a common accident the husband is presumed to have survived the wife.

These rules are based on the supposition that when males and females and the young and the old are exposed to similar hardships the males or the young and vigorous survive the females or the aged and weaklings, but Dr. Taylor asks, On what principles can such an inference be strictly drawn when many inappreciable and unascertainable circumstances may have led to an opposite result? He then says:—"There is no doubt that the rules, apart from the absolute arbitrary assumptions above, which influence English courts on these occasions are based on equitable principles. A right to property once acquired is not permitted to be taken away on a mere presumption; the right may be averted by the production of satisfactory evidence, medical or general, but until this is brought forward the property is considered to be vested in the holder and his heirs. Presumptions of a medical nature founded on age, sex, or the relative strength of persons, are rather to be regarded as assumptions needing to be supported by direct evidence or otherwise inadmissible."

It is, however, very certain that the rules and decisions of our courts do not stop litigation, and the reason, from the lay point of view, is not far to seek, and lies in the fact mentioned above, that until the evidence, such as it is, has been heard on oath in court no one is in a position—or rather nobody will assume the position of saying—to say whether the sworn statements do actually amount to *material evidence or not*, for the claimants to property naturally take that view (of statements) which supports each their own side of the claim. In the cases we are now considering the result is generally a compromise or a ruling

by a judge (without a jury) in accordance with the above principle that evidence of a very positive character must be adduced to upset a vested right.

The following cases very well illustrate the position, and also the decisions upon it:—

There is a well-known instance which is referred to by most medico-legal writers, that of General Stanwix, in which the General, with his second wife and a daughter by a former marriage, sailed in a vessel from Dublin to England. The ship, with all on board, was lost at sea, and no account of the manner of her perishing was ever received. Several suits arose out of this accident. The maternal uncle of the daughter claimed the effects of the General, under the principles of the civil law. This case was not decided; the suit was compromised on the recommendation of Lord Mansfield, who said he knew of no legal principle on which he could decide it. In another case, Sir W. Wynne said that in his judgment the most rational presumption was that all had died together; and that, therefore, none could transmit rights to another. In a third, where husband and wife were drowned, and a claim was made by the wife's relations, Sir J. Nicholl said he assumed that husband and wife perished at the same moment; and he therefore granted administration to the representative of the husband, as the person in whom the property really vested at the time of the decease of both. He, however, expressly observed that in giving this judgment he was not deciding that the husband actually survived the wife.

In a more recent case the property was vested in a wife, and she and her husband were drowned together without any of the circumstances being known. A claim was made by the husband's heirs, on the presumption that he was the survivor. Sir H. Jenner decided according to the principle that where a party dies possessed of property the right to that property passes to his next-of-kin, unless it be shown to have passed to another by survivorship. Here the next-of-kin of the husband claimed the property which was vested in the wife; that claim must therefore be made out; it must be shown by him that the husband survived. In the absence of evidence, the parties must be presumed to have died at the same time, and the property therefore would remain where it was vested, unless there was evidence to show that it had been devested by survivorship. See also case of Rivoire (*infra*).

Some years ago the following question was referred for a medical opinion: whether it was likely, in the drowning of persons of different ages and sexes in a confined apartment (the cabin of a vessel), that one should have survived the other. An officer in the army died in 1819, leaving a wife and two daughters, bequeathing property among them. In 1823 the widow married again, and by this second marriage she had several children; one of these, a son, survived. One of the daughters by the first marriage, Margaret, died in 1825, before majority, intestate, and leaving only as next-of-kin her sister Johanna and her mother. In 1834 the mother, her daughter Johanna, and her son, the last surviving child of the marriage between her and her second husband, were drowned on the coast of Norfolk, in the cabin of a sailing packet, while on their way to Scotland. The vessel filled with water from the skylights of the cabin during a storm. A few minutes before the catastrophe all in the cabin were seen and spoken to, but not one of them was heard to speak or was seen alive after the cabin had become filled with water, which was said to have happened instantaneously. The deaths of the mother, daughter, and son were supposed to have taken place at one and the same instant of time; at least it could not be proved by the direct testimony of any person that he saw any one of the three alive, or that he heard the cry or speech of any one of these three, after the death of the other or either of them. It may be mentioned that the mother was corpulent and, by the ill-treatment of her husband, a broken-hearted woman, about forty-two years of age; the daughter was a stout healthy girl of about twenty, and the son about six years of age. Physical and constitutional strength were thus decidedly in favour of the survivorship of the daughter Johanna, who was in right of considerable funds at the time of her death, and she died intestate. A claim was made for her property by her nearest blood relation, her paternal uncle-german. Her mother's second husband, being still alive, claimed the property as the representative of his wife or his son, presuming that Johanna died before them, and that her property became vested in them. The opinion of

Dr. Lushington as counsel being requested on this case, he stated that, as to the question of survivorship, the presumption of law, in the absence of evidence to the contrary, was that the mother, daughter, and son all died at the same moment. The consequence would be that none of the parties could transmit to the other. The paternal uncle would therefore be entitled to Johanna's property, on the principle already applied in so many cases: that, the property being vested in her, those who desire to take it on a presumption must produce evidence to show that she died before those persons through whom they set up a claim.

In this case there was not the least ground, medically speaking, for assuming that one of these persons survived the other. There was no evidence as to whether they were in different parts of the cabin, or whether the water reached one before the other; and, in the absence of all facts of this kind, it would be an arbitrary assumption to assign survivorship to one.

A husband and wife quarrelled. The wife was a passionate woman; she suddenly ran across a lawn from the room in which they were sitting (the windows being open to the ground), and threw herself into a deep pond. Her husband followed immediately and tried to save her from drowning. He either rushed or fell into the pond, and both were drowned. There was some evidence that the wife rose to the surface of the water after submersion, while the husband, it was stated, sank at once; but it was not made clear whether this reappearance of the woman's body on the surface took place before or after the submersion of her husband. There was, therefore, a want of evidence to fix the priority of death on either. The suit was compromised.

The following case, tried in England, arose out of the fate of the expedition to the polar seas undertaken by Sir J. Franklin in the year 1845. The first is that of *Ommaney* v. *Stillwell* (Rolls Court, November, 1856). His Honour, in giving judgment, said that, although there was no point of law in it, it was one of great difficulty to decide upon, from the paucity and singular nature of the evidence adduced. The sole question in the case was whether a father or son—*i.e.*, James or Ed. Couch—died first. James, the father, died in January, 1850. Of this there was no dispute. Edward, the son, went as mate on board Sir J. Franklin's ship *Erebus* on the Arctic expedition in August, 1845. The fact to be determined was whether he was alive or dead, and, if dead, whether he predeceased his father or not. The only evidence on this point was to be found in the statement of Dr. Rae upon the probable fate of Franklin and his crew. Rae stated that he discovered the remains of a number of persons supposed to be part of the 133 persons who joined in Sir J. Franklin's expedition, and in 1854 he was informed by some Esquimaux that in April or May, 1850, they saw a party of about thirty white men dragging a boat along, their ship being crushed up in the ice. Of these men all were pulling or pushing at the boat but one, who appeared to be their leader, and was supposed by Rae to be Sir J. Franklin. The Esquimaux further added that they saw the white men kill some birds which never visited that region before the month of May. Now, if this story of the Esquimaux could be relied upon, and it could in any way be shown that Ed. Couch was among those persons whose remains Rae had discovered, there would be some kind of evidence, at any rate, to show that Ed. Couch, being alive in May, 1850, survived his father, Jas. Couch, who died in January of that year. But there was nothing to show that Ed. Couch was one of these persons, or anything whatever that could satisfy his mind that Ed. Couch was among these then survivors of Sir J. Franklin's crew. One of the Chief Clerks of the court had, however, decided in favour of the son having survived the father, and, as it was just as impossible to say whether he did so survive or not, the court, for the purpose of avoiding further litigation, so far as lay in its power, would confirm the Chief Clerk's report. Decree accordingly.

In 1881 a man named Rivoire and his wife, both of the age of thirty-five years, were landing on the bank of the Rhone, when their boat was swamped by a passing steamer. They and their friends were simultaneously precipitated into the water. The woman seized another man of the party, one Maniette, who, however, disengaged himself from her grasp, seized her by the hair of the head, and proceeded to swim to the bank with the woman in tow. She was then apparently in a state of syncope. At this juncture the husband, who was frantically uttering cries, seized Maniotte by the neck, the result being that the two Rivoires sank simultaneously, and did not again rise to the surface. The body of the husband was not recovered, but that of the wife was found *in situ* next day. The countenance was placid, and there was great pallor of the surface. The property of the deceased

pair was so disposed by will that the blood relatives of the survivor acquired the whole. The respective representatives of Rivoire and his wife claimed the property; but in the end the suit was compromised. De Beauvais energetically contended that, taking into consideration the sex of the woman, which would favour syncope —and hence a slower death in the water than from asphyxia—the fact that she was observed to be to all appearance insensible before her final disappearance, and the state of her body after death, Madame Rivoire must of necessity have been the survivor. He strenuously contended also that M. Rivoire must of necessity also have perished from rapid asphyxia. Brouardel more cautiously declined to express any opinion, in the absence of an examination of the body of the husband, as to which of the two was the survivor (*Jour. de Méd. de Paris*, t. 2, pp. 91, 121).

Condition II.—Cases in which Evidence is Available.

In these cases we have to discuss not so much the bare fact that some one thinks he possesses evidence, as to see what in the way of evidence has been allowed to be material, and to see how it has been deemed to be material.

Sex.—Here any medical consideration has been swept on one side so far as general principles are concerned (*vide* cases above), and unless some definite facts have been presented to the court, no assumption lies of survivorship on the ground of sex. No case has been decided on this ground.

Age.—Precisely similar remarks apply to age as to sex, and no case has been decided on evidence of age.

Cause of Death.—Here we get some firm ground upon which evidence, and very material evidence, too, may be based. Thus if in a common accident, such as drowning, burial in a falling house, etc., one body is found with a *wound or wounds* upon it sufficient to cause very rapid death, and the other unwounded, such wound or wounds would be very material; but the medical jurist must very carefully consider the nature and precise cause of the wounds, in other words how far they could be caused by efforts to escape, and how far they would be likely to interfere with such efforts. If wounds only appear as the cause of death the jurist must carefully consider when, how, and why they were inflicted. For instance, two persons are found dead from wounds affecting different parts, and these wounds are of different degrees of severity—or two are found dead from any cause, and the body of the one is cold and rigid, while that of the other is warm and pliant. Here we have medical facts which may serve to guide the court, and enable it to come to a correct decision.

The following is a case in point:—In *Huelin* v. *Wilson*, before Malins, V.-C. (July, 1871), the question was whether the deceased Huelin survived his housekeeper or not. He had made a bequest in favour of this woman. In May, 1870, Huelin and his housekeeper were found dead in a house at Brompton. They had obviously been murdered. The body of Huelin was found buried, while that of the woman was packed in a box, and had marks of more recent death. The medical and circumstantial evidence left no doubt that the murder of the woman had not taken place until after the death of Huelin, the testator, and the Vice-Chancellor decided accordingly that she survived to take the bequest.

Suffocation.—Devergie asserts that a female will survive a male adult when both are equally exposed to suffocation from carbonic acid;

but no sufficient number of cases has been observed to allow a fair medical inference on this point to be drawn, and very strong evidence would be required by an English judge to satisfy him that such an opinion was universally correct. As little can it be presumed that the young perish from suffocation before the old. These events are commonly treated as involving circumstances which are from their nature unascertainable; and they are therefore dealt with according to fixed legal, and not according to variable medical, rules. There are probably no two cases of death from a common cause in which all the circumstances will be alike; hence any general medical rule for assigning survivorship to one in preference to another is inapplicable.

Very similar in its application is the medical evidence regarding **Time of Death.** We have (*vide* Sect. V.) discussed changes that take place in a body after death, and these changes in the dead body may occasionally have an important application to civil suits. When two persons are found dead under similar circumstances, a presumption of survivorship might arise in favour of one by reason of the condition of the body showing a more recent death. A husband and wife, the latter possessing property in her own right, may be found dead in the same apartment; the body of the husband may be cold and rigid, while that of the wife may be warm and pliant. It might in this case be presumed that the wife had survived the husband, and the heirs of the wife, if she died intestate, might claim her property. On the other hand, if the body of the wife was found in a state of decomposition, while that of the husband was either cooling or in a state of commencing rigidity, there could be no doubt, medically speaking, that the presumption of survivorship lay with the husband, although no human eye may have witnessed the death of either. In this case the few hours' survivorship might be held to transfer the property of the wife to the husband, or through him to the claimants on his part. In contested cases of presumed survivorship, the litigation between contending parties is often carried to an extreme degree, so that every medical or scientific fact which can be made available will be brought out on either side.

In a case in which husband and wife were found dead, both severely wounded and the bodies burnt, Ollivier remarked that the burns on the body of the wife had the characters of those which are produced during life, while those on the body of the husband were exactly like burns which are produced on a dead body. He thence inferred, as they were exposed to the same cause of burning, that the wife survived the husband; for he considered that all signs of vitality must have ceased in him before the fire could have reached his body.

Legal Evidence or Presumption of Death.—We have mentioned this point, *supra*, and stated that it had an important bearing on our present subject of survivorship. The point to emphasise is that, *though at the end of seven years the law definitely presumes death, during the seven years' absence any interested person must prove life.* The case on which this statement is founded is thus quoted by Tidy ("Leg. Med.," p. 406):—

"*In re Phenes's Trusts.*—If a person has not been heard of for seven years there is a presumption of law that he is dead, but at what time within that period he died is not a matter of presumption, but of

evidence, and the onus of proving that the death took place at any particular time within the seven years lies upon the person who claims a right to the establishment of which that fact is essential. There is no presumption of law in favour of the continuance of life, though an inference of fact may legitimately be drawn that a person alive and in health on a particular day was alive a short time afterwards. The testator died on January 5th, 1861, having bequeathed his residuary estate equally among his nephews and nieces. One of his nephews, N., was born in 1829; had gone to America in 1853; had frequently written home until August, 1858, on which date he wrote from on board an American ship of war. From that time no letter had been received from him, and nothing was afterwards heard about him, except that he was entered in the books of the American navy as having deserted on June 16th, 1860, while on leave. Held (reversing the decision of James, V.-C.) that his personal representative had not established a title to any share of the testator's estate, and it must be divided among the nephews and nieces who were proved to have survived the testator.

"The question, therefore, for those discharging the functions of a jury is whether the evidence of the person having been seen or heard of within a certain time is strong enough for them to say that such person was alive at that time, and the judge will direct the jury that if there is no evidence, or if they do not credit the evidence given of the person having been seen or heard of alive within seven years, the presumption of law that he is dead must decide their verdict. Thus the presumption of death must depend on general evidence. The very word 'presumption' implies supposition, as opposed to demonstration."

The following are a few cases that have depended on this judicial ruling:—

A case came before the Court of Session in Scotland in 1857. The question at issue was whether a naval officer who went out with the Franklin expedition was dead; and, if so, when must he be held to have died? The late Adam Fairholme, who died in 1853, bequeathed his property to his nephew, James Walter Fairholme, lieutenant in the Royal Navy, who sailed from Northfleet, on board the *Erebus*, for the North Seas, in May, 1845, and had not since been heard of. George Fairholme, another nephew, had instituted an action to have it found, under the destination of a codicil, that he was entitled to the whole of the testator's personal estate. This was opposed by other relatives, whose interests depended on whether or not James Walter survived his father. Proof by commission was taken with the view of legally establishing the questions raised in the case, and among those examined were Rae, Sir J. Richardson, James Hargreave, chief factor in the service of the Hudson's Bay Company, Captain Penny, and others. Rae expressed his belief that those persons who were reported to have been seen in the spring of 1850 must have died in the May of that year, and these he believed to have been the last survivors of Franklin's party. Hargreave thought that some of the party might have survived a single winter after they had been seen by the Esquimaux in 1850, but certainly not longer. Richardson said "that, if any of the party reached the country where they were said

to have been seen at the end of the winter of 1849–50, it was impossible for them to survive a single year with any means they could have at their disposal." Penny remarked: "I do not think that any of the party could have survived 1852; they must either have perished from hunger, or the hostile attacks of the natives." The Lord Ordinary reported the whole circumstances of the case to the Inner House, expressing his own opinion that there was thus strong presumptive evidence that Fairholme perished together with his companions some time prior to the end of 1852, and consequently that he predeceased his uncle, the testator, who died in May, 1853. He thought that, under these circumstances, the pursuer, George Fairholme, was entitled to a decree in his favour, but qualified by this condition, that before payment he should grant a bond with sufficient security to warrant the defender against all hazard from any claim to the money decerned for by Lieutenant Fairholme or others in his right.

In *Greetham* v. *Milnes* (Rolls Court, November, 1871) a question arose in reference to the survivorship of one Hentig, who was a member of Leichhardt's exploring party in Australia. They left Sydney for the interior in February, 1848, with the intention of traversing the continent, and had not since been heard of. The testator died in February, 1850, having bequeathed property to Hentig, who was his nephew. The heir-at-law of the testator claimed the property on the ground that Hentig died before the testator, who did not die until two years after Hentig was last seen and known to be alive. The heir-at-law of Hentig rested his claim on the absence of any proof of death at any time, and said that the members of the expedition, including Hentig, might have survived at least two years in Central Australia. The Master of the Rolls said that the inference he must draw from the established facts was that Hentig died within a year of the exploring party leaving Sydney, and that the heir-at-law of the testator was therefore entitled to the property.

In a similar case (*Lewis's Trusts*, Malins, V.-C., December, 1870) the question was whether a legatee did or did not survive a testator so as to take a sum of 4,000*l.* bequeathed to him under the will, which was dated in the year 1858. The testator died on February 20th, 1860. The legatee, Thomas Lewis, went to Australia in the year 1858, and the last that was heard of him was by a letter written to a cousin dated January 3rd, 1859. Seven years having elapsed, he was presumed to be dead, but the question was whether he survived his father. The Vice-Chancellor said that the law in cases of this kind presumed the continuance of life until the expiration of seven years, when the contrary presumption of death arose. The case of *Phenes's Trusts* had, however, displaced that rule, and had laid down that in all cases it was incumbent on a person claiming property by reason of a person being alive at any particular time to establish affirmatively that fact. It was manifest, therefore, that the representatives of the legatee, in order to claim their legacy, must show that the legatee survived the testator, the *onus probandi* being, according to the case cited, thrown upon them. They had not discharged, and could not discharge, that onus; therefore, as he was bound by the case in the Court of Appeal, he must hold that the legacy was never validly given, and that the residuary legatee took the fund as part of the estate.

R. v. *Lumley*.—The prisoner was convicted of bigamy. The first marriage was with Victor in the year 1836; the second marriage was with Lumley on July 9th, 1847. The prisoner lived with Victor until the middle of 1843, when they separated, and from that time no more was heard of him. There was no evidence as to his age. The judge at the trial directed the jury that it was a presumption of law that Victor was alive at the time of the second marriage. Held that there was no presumption of law that life continued for seven years, or for any other period after the time of the latest proof of the life of the party, and that it was a question of fact for the jury, under the circumstances of each case, whether a person be alive or dead at any time within the interval of seven years, at the termination of which the protection afforded by the statute in cases of bigamy comes into operation. The conviction was quashed.

In another case of a woman being tried for bigamy, the jury were asked whether, in their opinion, the prisoner knew her husband to be alive at the time she contracted the second marriage, and if not, whether she had the means of acquiring the knowledge. They were directed that, even if they thought her ignorant of her husband's being alive, she must still be found guilty if they also thought she had neglected to exercise such reasonable diligence in making inquiry as might have ascertained the fact of his existence. The jury said they had no evidence as to her knowledge; but that in their opinion she had the means of acquiring knowledge, if she had chosen to make use of them. Upon a case reserved after a verdict of guilty it was held that the conviction was wrong, the verdict being imperfect, as the jury had not found that the prisoner knew her husband was alive.

Direct Evidence.—This, if reliable, is obviously the strongest evidence that can be given.

It would seem from an old case, *Broughton* v. *Randall* (Croke's "Elizabeth," p. 503), that, provided there be some direct evidence, a very small amount of proof is required for survivorship. A father and son were seised as joint tenants and to the heirs of the son. Both father and son were hanged at the same time in one cart; but because the son, as deposed to by some of the witnesses, survived, as appeared by the shaking of his legs and probably some other tokens, the wife was held entitled to her dower (Best, *op. cit.*, p. 194).

In April, 1872, a case came before the Probate Court which involved the question of survivorship of husband or wife (*Re J. R. Jefferies*). It appeared in evidence that they had died on the same day and within a short time of each other, but there was some evidence that about an interval of two hours elapsed between the deaths of husband and wife, the husband being at the time an inmate of a lunatic asylum. The administration of the estate was claimed by the relatives of both, but as there was proof that the husband had really survived, although but a short time, the decision was made in favour of the relatives of the husband.

The case of *Underwood* v. *Wing* (Rolls Court, July, 1854) involved a singular question of survivorship. The opinions of J. Paget, Brinton, and the author, were requested on one of the questions at issue in this case, namely, whether, under an apparently simultaneous death from drowning as a result of shipwreck, the husband survived the wife or

the wife the husband for even the shortest conceivable period of time. The following is an outline of the facts :—

Mr. Underwood, æt. 43, and his wife, æt. 40, had a daughter aged eighteen, and two sons of the respective ages of fifteen and thirteen. The husband and wife were entitled to some property, and being about to go to Australia, with their children, they respectively made their wills, the one giving to the other absolutely the whole of their respective properties, and by each such will they declared that, if the one to whom the same was given should *die in the lifetime of the donor*, the property should go to, and be divided among, their three children on their attaining majority ; and that, in case all their said children died under twenty-one, they then directed that their property should go to their mutual friend, Mr. Wing, the defendant. Underwood was a tall, powerful man, with a full and broad chest, of the height of six feet one inch ; he weighed about twelve stone. His wife was a little woman of rather delicate habit, not exceeding five feet two inches in height, and weighing between eight and nine stone. They, together with their three children, sailed from London on October 13th, 1853, by the ship *Dalhousie*, and were wrecked off Beachy Head. Every person on board, with the exception of one seaman named Read, perished. Read stated that the ship foundered early on the morning of October 19th, and went over on her beam-ends, and so floated for about twenty minutes, and then went down. Shortly after she so went over Underwood, his wife, and their two boys were pulled out of the cabin window on to the side of the ship, Underwood having nothing on but his coat and trousers, his wife and the two boys being in their night-clothes. In the excitement of the moment, Underwood clasped his wife in his arms, and the boys clung to their mother. While in that position a heavy wave swept the four from the side of the ship into the sea, and, as the sailor says, he never saw them afterwards, so he presumes they all went down together. The daughter was seen alive on the deck shortly afterwards, and she was lashed by him to a spar and set adrift on the sea. It further appeared from the evidence of Read, the only witness of the facts, that he saw the daughter alive in the sea after the spar of timber had been cast adrift, and long after the father, mother, and sons had been swept overboard. Upon the question of survivorship, as to Mr. or Mrs. Underwood or of the two sons, a great body of evidence was adduced. Wooton and Hancock were examined, and they deposed that in their opinion the deaths of all the four—*i.e.*, the father and mother and two sons—had been *simultaneous*. Other surgeons had been examined who gave it as their opinion that Underwood, who was a strong man and a good swimmer, must have survived his wife and children in the waves, and that a man accustomed to swim would have it in his power to preserve his breath longer than a woman or boys so young as his two sons. Others thought that, whilst the woman and her sons died of asphyxia, the man, being strong and muscular, might have died before them from an attack of apoplexy.

The Master of the Rolls held that the weight of evidence as to Mr. and Mrs. Underwood and the sons was that they had been swept off the wreck at one and the same moment, and had perished simultaneously. The evidence of Read, who conducted himself with great courage and humanity upon the occasion, appeared to be worthy of

credence, and he decided that as respected these four individuals there was no survivorship. With respect to the daughter Catherine, it was established beyond a doubt, as he thought, that she had been seen alive after her parents and brothers had perished in the raging sea. Then in her instance there was no doubt she survived them, and the result must be that the property could not vest in the defendant, but in the plaintiff, who was the next-of-kin of Catherine Underwood. The event upon which the defendant was to take never arose, and the claim of the plaintiff, as next-of-kin, was fully established.

The case was carried by appeal to the Lord Chancellor's Court. The point referred for our consideration was not whether the daughter survived the parents (as all the children died under the age of twenty-one), but whether, upon ordinary physiological principles, the husband must not have survived the wife, or the wife the husband, and in either case the defendant would have a well-founded claim to the property. The plaintiff, Underwood, a lady, and next-of-kin of the husband, claimed the property on the ground that neither survived the other, and that both must have died together.

The joint opinion was to the effect that the great strength of the husband, with the knowledge that he was a good swimmer, would justify a medical inference that he might probably have survived his wife, although only for a short period. Further, we were of opinion that, considering the nature of death by asphyxia, even if husband and wife were submerged at the same instant of time, there was no proof that they had really died at the same instant. Taking death to consist in the entire and permanent stoppage of the action of the heart, it could not be inferred of these two persons, differing as they did in age, sex, and strength, that the heart in each ceased to pulsate at the same fractional part of a second of time. Unless this physiological improbability, if not impossibility, were admitted, then it followed either that the husband survived the wife, or the wife the husband, and in either case Wing, the defendant, would take the property under the will of either. The case was heard by the Lord Chancellor (Cranworth) and two of the common law judges; and in February, 1855, the Lord Chancellor delivered the following judgment:—

The Master of the Rolls held that, as the only title of the defendant rested upon a survivorship, it was incumbent upon him to make out his case. No such case had been made out, and therefore the plaintiff, as representing the next-of-kin, was entitled to the property. His Honour was also reported to have stated it to be his opinion that the evidence had the legal effect of proving that Mr. and Mrs. Underwood died at the same time. In this latter opinion the judges differed from the Master of the Rolls, but agreed with him on the main point: that the defendant had failed to make out his title. His Lordship in now giving judgment said that he had had a conversation with the Master of the Rolls since the opinions of the judges had been given, and his Honour had stated that he did not mean, by any expressions he might have used, to declare it to be his opinion that Mr. and Mrs. Underwood died at the same time. All that he meant was, that, in the absence of any positive evidence on the point, the property *must go in the same way as if they had actually expired at the same moment.* Without doubt it was almost impossible that two human beings could

die at the same moment. Time, like space, was divisible into infinitesimal parts, and one of them might be considered as having died a millionth part of a second before the other. The real point in the case, however, was that it was not known, and could not be ascertained, which of the two, the husband or the wife, was the survivor. The first and simple view of the case was, that a lady disposed of her property by will to a particular person in the event of her husband dying in her lifetime. Now, in the absence of any proof that the contingency upon which the gift depended had taken place, the property must be considered as undisposed of, and the appeal would, as a matter of course, have been dismissed. An ingenious argument had, however, been made use of for the defendant to the effect that, as there was a manifest intention in the will of Mrs. Underwood to dispose of her property in the event of her surviving her husband, the onus of proving that she did not survive him lay upon the parties disputing the disposition, and a great number of cases had been cited in support of this view. His Lordship then analysed the cases, and stated it to be his opinion that they did not affect the present case, and he therefore came to the conclusion that the decision of the Master of the Rolls was correct. The appeal must be dismissed, but, under the peculiar circumstances of the case, without costs. Litigation did not stop here. The case was carried by appeal to the House of Lords, and in February, 1860, six years after the commencement of the suit, a final judgment was given confirming the decree of the Master of the Rolls and of Lord Cranworth, the then Lord Chancellor (Campbell) dissenting from this decision.

In reference to this case, it is obvious that the difficulty was created by the legal rule which threw the onus of proof on the claimant under the two wills. The case for the next-of-kin, who was not mentioned in the will, was that the husband and wife died at the same instant of time; but this was a physiological impossibility; and had the proof of this been thrown upon the plaintiff, the case must have failed. The contention of the defendant was that the testator and testatrix could not have died at the same instant. This negative proposition could not, of course, be proved by direct evidence; it became simply a medical inference: but when the law declares that, in the absence of evidence, the property shall go in the same way as if the parties had actually expired at the same instant—*i.e.*, as if they had died intestate—this is deciding such questions by a rule which is as arbitrary in its operation as that of the French code. In *Underwood* v. *Wing* this rule of law practically affirmed that an event took place which was physiologically impossible, and upon that event the wills of husband and wife were set aside, and the property was handed to one whose name was excluded from both wills.

Hugh Swinton Ball, with his wife and adopted daughter, was lost on board the steamer *Pulaske*, on the coast of America, on June 14th, 1838. By his will Ball bequeathed his property to his wife, and a claim was made by her heirs on the ground that she had survived her husband. It seems that an explosion took place on board the steamer at eleven o'clock at night, and that husband and wife were at the time in different parts of the vessel, and thus separated from each other. Mr. Ball was not seen after the explosion, and, although he perished

with many others, the precise time at which he died could not be determined. Mrs. Ball was seen after the explosion, rushing in a terrified manner about the deck, calling for her husband, but no reply was made. She was soon afterwards missed, the promenade deck, to which she had retreated, having been submerged with herself and all who were on it. Chancellor Johnson, before whom the case was argued, said that it was a case to be decided by testimony, and as the right on the part of Mrs. Ball was derivative, the burden was on the plaintiffs to prove that she was the survivor. The evidence regarding the non-appearance of Ball, when, had he been living, there was sufficient time for him to have shown himself with others on deck, and to have made an effort to join his wife, was considered by the Chancellor to be conclusive of his death at the time that the wife was seen and recognised by many who knew her. On these considerations he decided in favour of the plaintiffs, that the wife survived the husband, and, therefore, she succeeded to his estate. On appeal this decision was confirmed (*Amer. Jour. of Med. Sci.*, July, 1845). This case is peculiar in the fact that the wife alone was seen living, and the nature of the accident was such as to render it probable that the husband had perished in the explosion. The counsel for the defendants ingeniously argued that as the death of the wife could be fixed, while that of the husband could not be fixed, it was fair to presume that she died first, but this argument failed to satisfy the court. The plaintiffs were not required to prove when the husband really died; they established enough to render it probable that the wife was the survivor.

It will be seen that these cases may be divided into two classes: those in which there is direct evidence about the death of both parties or of all and those in which there is direct evidence of the survivorship of one of the parties, the death of the other being presumed.

The editor is only aware of one very recent case, still *sub judice*, where direct evidence is likely to prove the only material evidence. In 1903 a rich American, named Fair, was travelling in a motor-car with his wife in France. The car was upset, and both were killed. The question of which survived the other became very material to the disposition of Mr. Fair's wealth, and there seems no possibility by medical means only of deciding the question.

In January, 1904, a witness came forward to depose that he arrived about two hours after the accident, and in describing the scene to him the concierge of the château distinctly said that she found Mr. Fair motionless and dead, having apparently been killed instantly, while Mrs. Fair's hands were still writhing with convulsive movements. Judge Ganneval has taken his testimony, and it will be added to the evidence. Should this evidence stand the severe cross-examination to which it will be submitted, it must go far towards deciding the case.

Death of Mother and Child in Parturition.—The author's original remarks on this are—"There has been much ingenious discussion as to the survivorship of the mother or child when both die during delivery, and nothing is known respecting their deaths. So far as we are aware, this question has only occurred once in an old case, quoted by Beck; and then some local German court arbitrarily decided that the child survived the mother, basing its decision,

according to Valentin, upon the grounds—(1) that the mother was exhausted by the labour, and (2) that the infant would not have died until deprived by the death of the mother of its nourishment. Now it is quite possible that the child might have died soon after its birth, and the mother have survived; at any rate, the medical reasons for this view are just as good and just as forcible as those against it, and the only equitable mode of dealing with such cases, when a legal question of a right to property is dependent on the decision, is to treat them according to the principles followed in contested survivorship. Those who would benefit by the presumption that the child survived the mother should be required to adduce satisfactory proofs."

Dr. Tidy ("Leg. Med.," p. 393) thus discusses the situation:—

"1. *Death by Parturition.*—If mother and child both die in childbed without witnesses, the presumption is that the mother survived the child. For, *first*, there is a *primâ facie* probability of the child being still-born, and that a woman in childbed without attention or attendance will be unable to render her child the assistance necessary for its preservation. *Secondly*, a large child, or external marks of a difficult labour, or the absence of the signs of respiration, would suggest the death of the child as occurring before that of the mother. Thus, from both points of view, the presumption of survivorship in those rare cases where mother and child both die is in favour of the mother.

"We agree with most medical jurists that those who assert that the child survived the mother should be required to adduce definite evidence of their contention. At the same time, it must be remembered that although the child may die from cold, or from suffocation, or from its being of unusual size, or from protracted labour, or from labour complicated with convulsions, or from pressure on the umbilical cord, or from partial detachment of the placenta, and other causes, nevertheless the mother runs the risk (and that risk a very dangerous one) of hæmorrhage. Again, it is quite conceivable that a mother might give birth to a child and herself tie the cord, and then die of syncope from the exhaustion consequent on the effort, whereas the child would be temporarily safe."

It will be thus seen that in England everything depends on the nature of the evidence. Dr. Tidy ("Leg. Med.," p. 384) quotes the French, Prussian, and Mahometan laws as follows. They hardly need comment in an English book on jurisprudence, but they would certainly seem to the editor to be in a position to prevent much perjury and waste of money:—

"The *French* law, as contained in the Code Napoléon, is as follows:—

"1. If several persons, naturally heirs of each other, perish by the same event, without the possibility of knowing which died first, the presumption as to survivorship shall be determined by the circumstances of the case, and in default thereof by strength of age and sex.

"2. If those who perished together were under fifteen years, the oldest shall be presumed the survivor.

"3. If they were all above sixty years of age, then the youngest shall be presumed the survivor.

"4. If some were under fifteen, and others above sixty, the former shall be presumed the survivors.

"5. If those who perished together were over the age of fifteen, but under sixty, the males shall be presumed the survivors where the ages are equal, or the difference does not exceed one year.

"6. If they were of the same sex, that presumption shall be admitted which opens the succession in the order of nature. Of course the younger shall be considered to have survived the other."

By sect. 1 of the French code, if definite evidence can be produced as to who was the survivor, the case is then decided on its merits, but failing this, sects. 2 to 6 lay down the precise conditions of age and sex on which survivorship is to be decided. Sects. 2 to 4 relate specially to *age*. Sects. 2 and 3 are, regarded medico-legally, undoubtedly sound, but sect. 4 appears to be scarcely so satisfactory, because it draws no distinction between an infant of one year old and a man of sixty-one years of age. The latter may fairly be supposed to have a better chance of life than the former, whilst sect. 4 actually gives the advantage to the infant. Sects. 5 and 6 have special reference to *sex*.

The *Prussian* Common Law (Part I., tit. 1, § 39) and Civil Code (Articles 720, 721, 722), quoted by Casper (Dr. Balfour's translation, vol. 1, p. 14), are identical in spirit with the Code Napoléon.

By the *Mahometan* law of India, when relatives perish together "it is to be presumed that they all died at the same moment, and the property of each shall pass to his living heirs without any portion of it vesting in his companions in misfortune."

SECTION VII.

WOUNDS AND PERSONAL INJURIES.

SUB-SECTION A.—GENERAL WOUNDS.

LEGAL CONSIDERATIONS:
QUOTATION FROM 24 & 25 VICT. C. 100.
DEFINITION OF A WOUND — BRUISE — LACERATED WOUND — PUNCTURED WOUND—ECCHYMOSIS OR EFFUSION—STABS AND CUTS.
WEAPONS—NEED NOT BE DEFINED.
GRIEVOUS BODILY HARM.
WOUNDS—
POINTS TO BE NOTED IN ALL WOUNDS.
IS THIS WOUND DANGEROUS TO LIFE?
IS IT, IF NOT IMMEDIATELY DANGEROUS, LIKELY TO LEAVE PERMANENT INJURY?
WAS IT, OR WERE THEY, THE CAUSE OF DEATH (*a*) DIRECTLY, (*b*) INDIRECTLY?
WHICH OF TWO WOUNDS CAUSED DEATH?
WHEN WAS THIS WOUND OR BRUISE INFLICTED?
WITH WHAT WEAPON OR HOW WAS IT INFLICTED?
WAS IT INFLICTED DURING LIFE OR AFTER DEATH?
IF BEFORE DEATH, HOW LONG DID THE VICTIM SURVIVE? INCLUDING, WHAT COULD HE DO IN THE WAY OF MOVEMENT?
IF BEFORE DEATH, WAS IT ACCIDENT, SUICIDE, OR HOMICIDE?
WOUNDS OF SPECIAL REGIONS.
FEIGNED OR SELF-INFLICTED NON-FATAL WOUNDS.

LEGAL CONSIDERATIONS.

Statute 24 & 25 Vict. c. 100, date 1861:—Sect. 11 runs, "Whosoever shall by any means whatsoever wound or cause any grievous bodily harm to any person with intent to commit murder shall be guilty of felony."

Sect. 18 runs, "Whosoever shall unlawfully and maliciously by any means whatsoever wound or cause any grievous bodily harm to any person, or shoot at any person, or, by drawing a trigger or in any other manner, attempt to discharge any kind of loaded arms at any person with intent, in any of the cases aforesaid, to maim, disfigure, or disable any person, or to do some other grievous bodily harm to any person, . . . shall be guilty of felony."

Sect. 20 runs, "Whosoever shall unlawfully and maliciously wound or inflict any grievous bodily harm upon any other person either with or without any weapon or instrument shall be guilty of a misdemeanour."

Definition of a Wound.—In the preamble to the above statute it says, "Whereas it is advisable to consolidate and amend the law relating to offences against the person." These words may be fairly

taken to mean that judges found that the eternal quibbling about what was and what was not a wound, about what was and what was not a weapon, tended only to the derision of the law and the unmerited escape of criminals, and so they determined to end these quibbles if possible. Medical men are in the former case mainly responsible for such silly quibbling, for which no excuse should exist, for it is very easy to define a wound, or at least to express the idea underlying the word.

A Wound is a Solution of the Natural Continuity of any of the Tissues of the Body.

This definition expressly omits—

(1) Any reference to the effusion of blood. For it is quite possible either to wound or to cause grievous bodily harm to a person without causing the effusion of a single drop of blood. A wound of the cornea of the eye, for example, may result in even death without spilling of blood; and assuredly, in ordinary medical parlance, we speak of abrasions and injuries of the cornea as wounds of the cornea.

(2) Any allusion to the skin being severed. What, one may ask in amazement, is there so sacred about the skin that it should be elevated to the position of being the only tissue in the body the laceration of which constitutes a wound, when in ordinary medical conversation one is constantly referring to wounds of the liver, of the spleen, of the intestines, etc., etc.?

(3) Any allusion to the nature of the tissue damaged. Why should a fractured bone, or a dislocated joint, not be a wound?

The only objection the editor can see to the definition is that in strictness it includes cutting the hair or nails, for these are tissues of the body; but this is a purely academic or theoretical objection, for *maliciously* cutting the hair or nails, against a person's will, is an assault with a maximum penalty quite as severe as the minimum penalty for wounding (sects. 42 and 20): and punishment for all these offences is measured, and rightly so, by the intention of the offender and the result of his action, so that it is quite within a judge's or magistrate's power to make the punishment fit the crime from a common-sense point of view.

The overwhelming advantages of the definition are that it includes bruises, the effects of burns from fire and heat and electricity, the effects of any corrosive liquid or solid (they assuredly destroy the continuity of the tissues constituting the true skin), all lacerations and bruises of internal organs or tissues; it prevents any possible quibble about the skin being or not being severed: it makes no reference to how or by what means produced; it is short and simple, and is constantly being used in professional discussions in relation to all organs; it assuredly includes all dislocations of joints and fractures of bones, and quite rightly, too, for they in turn include some of the most severe injuries and "grievous harm" that can be done to a limb.

When we are gravely told (in previous editions of this work with references) that a jaw fractured in two places, that a skull so broken internally as to cause permanent blindness and deafness on one side, that a fatal meningeal hæmorrhage from a blow on the head, have been

ruled out as not wounds within the meaning of the Act, we cannot wonder at the expediency of amending the Act, and of asking for a definition of a wound, and that, too, one which will include such severe injuries to the person.

If it be objected that the law did not intend to include slight scratches from finger-nails and the like, pin-pricks, and trivial wounds of this description, it may be at once retorted, from a medical point of view, that many of these, and especially small punctured wounds from a small sharp object that is septic or dirty, are more dangerous to life than many open wounds. In practice on the Continent there seems to be accepted a definition very close to the one above.

Having thus defined a wound in general terms, it becomes very easy to define other injuries and bring them under the same heading.

A Bruise is a wound of such a nature that the solution of continuity affects one or more bloodvessels in such a manner that some or all of the blood effused from the rupture of the vessel is unable to escape freely from the surface either of the severed skin, or of the organ in which the solution of continuity is situated. [In the case of organs, such as the cornea of the eye or the cartilages of bone, which have no bloodvessels, a bruise may be defined as a crushing of the tissues producing a solution of continuity in them.] In common language, the terms bruise and bruising generally only refer to the blood which is effused in consequence of the rupture of a vessel or vessels and to the tissues amongst which this blood has soaked ; they have no reference to the wound which allowed the effusion to take place.

A Bruised Wound is a wound in which a good deal of the blood has escaped from the solution of continuity, but some has also either soaked into, or been effused into, the surrounding tissues. (In the latter case vessels have been severed amongst these tissues other than those the blood from which is immediately enabled to escape through the main solution of continuity.)

A Lacerated Wound is a wound the edges of which are irregular and not clean cut.

A Punctured Wound is one in which the depth (measured from the surface of the wounded part) is great in proportion to the length (measured along the surface of the wounded part).

Ecchymosis or Effusion.—Inasmuch as these two words are frequently used by medical men in describing injuries, it is well to draw attention to their meanings. They both mean in our present connection the same thing, viz., a pouring out, and they are applied to the outpouring of blood amongst the tissues which follows a solution of continuity of a bloodvessel. Custom has to some extent limited their uses below their strict meanings as given above. Thus it is only a very small outpouring of blood, say about a few millimetres in size, that is spoken of as an ecchymosis, and one, too, which is due to a diseased process as opposed to mechanical violence. For instance, the little spots of escaped blood beneath the pleura in asphyxia are commonly spoken of as ecchymoses or ecchymosed spots (often also called petechiæ). It is advisable for a medical witness to avoid the terms in giving evidence and use the term bruise when he wishes to indicate that blood has escaped into the tissues as the result of

violence. If he thinks the escape was due to disease, let him say so in plain language: "The spots that I saw looked as though they were due to bruising from violence, but in my opinion they were due to disease." This is pre-eminently the occasion for the use of terms which cannot be misunderstood by laymen.

Stabs and Cuts.—Formerly these were distinguished from wounding, and many acquittals took place owing to this distinction. All this is swept away by 24 & 25 Vict. c. 100, and need not now be touched upon. At the same time a medical witness should be prepared to describe fully the injury which he terms a wound.

What are Weapons?—Those legal doubts which formerly arose in reference to the true signification of the term *weapon* have been removed by statute. Thus the teeth, the uncovered hands or feet, were formerly held by the judges *not* to be weapons; and injuries produced by them, however severe, were not treated as wounds within the meaning of the statute. Parties were tried on charges of biting off fingers and noses, and althongh the medical evidence proved that wounds of a severe kind had been thus inflicted, and that great disfigurement and mischief had been done to individuals, yet the nature of the injury produced was not so much regarded as the actual method by which it was accomplished. The persons charged were acquitted under an indictment for "wounding," since wounds in a legal sense could be produced only by weapons, while the teeth, hands, and feet were not weapons in law. On a trial which took place at the Nottingham Assizes in 1832 a strenuous effort was made by prisoner's counsel to claim for artificial arms and legs the same privilege of exemption that was accorded to natural arms and legs. In the case alluded to, it was argued in defence that a wooden arm with an iron hook at the end of it, with which an assault was committed, had become, by long use, part of the body of the prisoner, and that, like a natural arm, it ought not to be considered a weapon in law. The objection was overruled. Except in so far as the deliberate use of a weapon may indicate an intent to inflict a greater amount of personal injury, such questions as these cannot now arise. A man named Benson was tried for a felonious assault (C. C. C., November, 1871). The evidence showed that the prisoner, having no left hand, struck the prosecutor on the face with an iron hook which served as a substitute, and produced serious injuries. He conducted his own defence, but did not base it on the theory that the iron hook was a substitute for his natural means of defence, and was found guilty.

At the Liverpool Spring Assizes, May, 1885, in *Reg.* v. *Barnes*, before Mr. Justice Smith, a prisoner was charged with unlawful wounding by biting a constable. He was convicted. Three months.

Hatpins are distinctly to be held as weapons, and may be very dangerous ones.

A young married woman, named Rose Walton, of Sheffield, was sentenced to twelve months' hard labour at Derbyshire Quarter Sessions in January, 1904, for maliciously wounding Edward Herring at Eckington on November 30th. The evidence showed that the prisoner was drunk at the Brown Cow at Eckington and struck the landlady. Herring went to the latter's assistance, and when he had ejected Walton she rushed at him and struck him in the eye with a hatpin. The eye had to be removed, and it was feared the injury would cause total blindness to the other one.

Grievous Bodily Harm.—With such a comprehensive definition of a wound, there is very little positive ground left for these words to cover. They might include shocks from electricity which did not burn, tight ligatures placed round limbs or round the penis, foreign bodies inserted into rectum or vagina, burns that did not wound (first degree, or mere redness), the throwing of liquids which are not corrosive, merely staining or irritating the skin, and possibly a few other injuries; but with these, as with wounds, the *intent* with which they were inflicted is of more importance in some ways than the injury itself.

In former editions of this work, when a wound was very inefficiently, if at all, defined, Dr. Taylor remarked:—

"These words have a vague signification; but it would perhaps be difficult to substitute for them others less open to criticism. They evidently refer to a minor description of offence, and are applied commonly to those injuries which, while they do not actually place life in danger, may be attended with considerable personal inconvenience, or be in some way detrimental to the health of the wounded party. Pollock, C.B., stated on one occasion that 'grievous bodily harm' would reasonably apply to such an injury as would render medical treatment necessary. It is always a question for a jury whether the *intent* of the prisoner, in inflicting a wound, was or was not to produce grievous bodily harm. Sometimes the nature or the situation of a wound, as well as the kind of weapon used, will at once explain the intent. So far the medical witness may assist the court by giving a plain description of the injury, as well as of the consequences with which it is usually attended. It may happen either that the wound itself is not of a serious nature, and yet the intention of a prisoner may have been to do grievous bodily harm; or, as in the following case, the injury may be really serious, and yet the prisoner may not have intended to do grievous bodily harm. A man was indicted for feloniously wounding a girl, with intent to do grievous bodily harm. He kicked her in the lower part of her abdomen. The surgeon described the injury as of the most serious character, and said that at one time he considered the life of the prosecutrix in danger. She was still suffering, and would probably feel the effects of the injury for the rest of her life. The judge in summing up the case told the jury that the material question for them to consider was the *intent* of the prisoner. It was not because serious injury was the result of a prisoner's act that they were therefore to infer his intention was to do that injury; and they were to judge, from all the circumstances, whether at the time he kicked the prosecutrix he intended to do her grievous bodily harm, as was imputed to him by the indictment, or whether he was merely guilty of a common assault. He was found guilty of a common assault (*Reg.* v. *Haynes*, C.C.C., September, 1847). In *Reg.* v. *Davis* (Chelmsford Aut. Ass., 1871) a man was charged with wounding with *intent* to do grievous bodily harm. It appeared from the evidence that the prisoner, half drunk, and during a quarrel, suddenly stabbed the prosecutor, inflicting a dangerous wound, with which he was laid up for a month. For a fortnight he was in danger. It was contended that there was no intent to produce grievous bodily harm. Bramwell, B., said the jury might satisfy themselves on that point by looking to the circumstances of the case.

Could a man inflict such a wound as this without having an intention to inflict grievous bodily injury? The prisoner was not so drunk but that he knew what he was doing, and all the circumstances showed premeditation and intention: the nature of the wound, the weapon used, and the part of the body struck, where an injury was so likely to be dangerous. The prisoner was found guilty of the intent. In cases of this description, the intent with which a wound was inflicted is usually made out by evidence of a non-medical kind."

In April, 1904, at Market Deeping, in Lincolnshire, an extraordinary event happened in which "grievous bodily harm," resulting in death, took place. The editor is writing these notes on the case from information given privately by the medical man who did the post-mortem examination, but before the trial, which is to take place at the Lincoln Assizes in July, 1904, so that he is unaware what precise term will be applied to the injuries, nor indeed does he know what view, whether accident or homicide, may be taken of it; but, as it is a case of a unique nature, it must be inserted here.

The facts are these: The victim was on the ground with a second person lying on the upper part of his body, while a third passed the nozzle of a force-pump[1] through a hole in the victim's trousers and up his anus, and then turned the stopcock, allowing air to rush into the intestine. On autopsy two rents were found in the bowel, and the cause of death was shock and peritonitis. The coroner's jury returned the following verdict: "That deceased met with foul play at the hands of A., B., and C., who feloniously did kill him." Before the magistrates Mr. Gerald Wm. Stone, house surgeon at Stamford Infirmary, repeated in effect the evidence he gave at the inquest. He added that the face of the deceased was slightly congested, and the pulse was imperceptible. He was rigid, and his fingers locked together. His breathing was short and laboured, and on examination he found that his abdomen was highly distended with gas. The lower outlet of the bowel was dilated, and the bowel pushed down into it. He could not push a tube either through deceased's mouth or his anus, he was so highly blown. Witness sent for Dr. Greenwood, who inserted an aspiration needle into the abdomen, and a quantity of gas was expelled. Deceased then appeared better, but about half an hour afterwards, he complained of pain in the lower part of his body, which got worse, and he suddenly collapsed and died about a quarter to five on the 22nd inst. The following day witness made a post-mortem examination, when he found a rupture of the gut. Eight inches from the outlet there were two rents, one one and a half inches long and the other three-quarters of an inch long, which might have been caused by the nozzle of the pump. The gut round the vent was gangrenous and congested, which might have been caused by peritonitis, due to the rupture of the gut. There were no marks or bruises on the body of the deceased. He could not tell if the pipe had been put up the anus.

The editor would maintain that this is a case of wounding well within any definition of a wound, but on the culpability of the men he has no means of offering any opinion.

At the Central Criminal Court in February, 1904, in *R.* v. *Jarvis and Mudd*, pouring boiling water over a woman was termed grievous bodily harm, as follows:— A child of the victim, æt. 8 (*vide* "Age of a Witness"), said: "I remember tho two prisoners bursting our door open; they then knocked mother down, and tho woman took the kettlo of hot water off tho firo and poured it ovor her. Mother yelled out, and tho two people ran off. Mother did not tako tho kettle off the fire hersolf."

Charles Graham Grant: I am police surgeon of the H Division. I saw tho

[1] The pump was ono of thoso used to free gas pipes in winter from accumulations of solid matter. Air is pumped into a chambor at considerable pressuro, and is thon suddenly released by turning tho stopcock so that air rushes violently through tho nozzle to force out any obstaclo.

prosecutrix about 8 p.m. on January 28th. She was suffering from a scald on her right arm, four inches by three, and a similar injury to her forehead and scalp. She would not entertain the idea of going to the hospital, so I visited her the next morning. I then found her lips swollen and her right eye very much closed. Her pulse was 126 to the minute. I saw her four days ago, and she was then practically well. She must have suffered great pain. If the temperature of the water had been a little higher she would have lost her sight. I do not think her injuries are consistent with her falling down with a kettle. Guilty: Jarvis, twelve months; Mudd, two years.

WOUNDS FROM THE MEDICAL POINT OF VIEW.

In every wound that a medical jurist is called upon to examine the following points should all of them be invariably attended to, and the results *written* down as soon as possible.

The Points to be Noted in Every Wound.

Points.	*Associated with—*
1. Number.	1. (*a*) Shock and hæmorrhage. (*b*) Possibility of self-infliction. (*c*) Evidence of struggle. (*d*) Nature of weapon. (*e*) Reason in general for multiplicity.
2. Position, including the organ wounded.	2. Self-inflicted, danger to life, etc.
3. Direction.	3. How inflicted.
4. Depth, at ends especially.	4. Danger to life and how inflicted, etc.
5. Length or size.	5. Chiefly how inflicted in incised wounds, danger to life, etc.
6. Nature (punctured[1], incised[2], lacerated, bruised, etc.).	6. Danger to life and nature of weapon.
7. Condition of edges (jagged, bruised, etc.).	7. Nature of weapon.
8. Condition of ends, undercut or not.	8. Nature of weapon.
9. Foreign bodies in them.	9. How inflicted, bits of glass, dirt, hair, etc., commonest.
10. Hæmorrhage from them and its amount.	10. Danger to life.
11. Inflammatory reaction and processes, swelling, pus, scabs, granulations, etc.	11. Chiefly required in answer to question ante *v.* post mortem, and when inflicted.

Each and all of these may be of vital importance for drawing accurate conclusions when a medical man ceases to be a common witness of fact, and commences his more appropriate function of giving expert evidence.

Care must be taken that putrefaction is not mistaken for a gangrenous condition of the wound (*vide* "Putrefaction"). The wound may be

[1] A punctured wound is one the depth of which is greater than its free opening.

[2] Incised—literally cut in—is a wound the superficial length of which is usually much greater than its depth

examined if it be necessary, as in punctured wounds, by gently introducing into it a bougie and carrying on the dissection around this instrument, avoiding as much as possible any interference with the external appearances, but great care must be exercised in this introducing an instrument into a wound for fear of the assertion that the instrument, and not the original weapon, perforated the tissues. The preservation of the external form will allow of a comparison being made at any future time between the edges of a wound and a weapon found on a suspected person. In the dissection every muscle, vessel, nerve, or organ involved in the injury, should be traced and described. This will enable a witness to answer many collateral questions that may unexpectedly arise during the inquiry. Another point should be especially attended to. A medical practitioner has frequently contented himself by confining his dissection to the injured part, thinking that on the trial of an accused party the question of counsel would be limited to the situation and extent of the wound only, but this is a mistake. If the cause of death be obscure, on no account should the inspection be abandoned until all the important organs and cavities of the body have been closely examined, since it may be affirmed that a natural cause of death might have existed in that organ or cavity which the medical witness had neglected to examine (*Reg.* v. *Solloway*, Abingdon Aut. Ass., 1860). It rests with the practitioner to disprove the probability thus urged by counsel; but if he has no facts on which he can base an opinion, the prisoner, of whose guilt there may be but little doubt, will have the benefit of his inattention and be acquitted by the jury. More will be found on this subject, *infra*, where "Coincident or Consecutive Disease and Wounds" are discussed.

In the medical reports on the examination of the bodies of wounded persons, care should be taken to avoid the introduction of any remarks in the form of inferences from or comments on the facts of the case. At the trial of McLachlan (Glasgow Sept. Circ., 1862), Lord Deas objected to the statements in the medical report "that the body of deceased had been found under circumstances of great suspicion," and "that there were marks of a severe conflict." When the witness was cross-examined on the medical fact which had led him to the conclusion that there had been a "severe conflict," it resolved itself into the statement that there were marks of blood on the flags, which indicated that the body had been dragged along the floor *after death;* but he was unable to mention any medical facts by which this form of expression could be justified. Inferences of this kind should, as a rule, be excluded from medical evidence and reports.

It is impossible to impress too strongly on the mind of a medical witness that in describing the wounds which he has found on the examination of a body he should use plain and simple language, and avoid as much as possible the use of technical or professional terms. The natural desire of a good witness is to make himself understood; but this cannot be accomplished if he clothes his ideas in language which is incomprehensible to educated men of the legal profession, and *à fortiori* to the class of men who constitute juries. A medical witness should, for his own credit and for that of the profession to which he belongs, employ plain and simple language in describing a wound, as well as in giving his evidence generally (see "Evidence").

Is this Wound Dangerous to Life?

An answer to this question may be demanded for various reasons, but more particularly when bail is being considered in the case of a man charged with an attempt to murder or maim or wound. Bail cannot, of course, be accepted without very grave consideration when the major charge of murder or criminal manslaughter is likely to arise.

The meaning of the words *dangerous to life* is left entirely to the professional knowledge of a witness. It is not sufficient on these occasions that he should make a simple declaration of the wound being dangerous to life; he must, if called upon, state, and that usually in writing, to the court satisfactory reasons for this opinion; and these reasons may be rigorously inquired into by counsel for the defence.

Danger primarily depends upon—

(*a*) The amount of hæmorrhage.	(*a*) Judged by what is seen spilled around and by the colour of the patient, the latter especially in concealed hæmorrhage.
(*b*) The organ wounded.	(*b*) Generally fairly obvious—large vessels, gut (peritonitis), liver (hæmorrhage), brain (septic hernia cerebri), heart (hæmorrhage), lungs (traumatic pneumonia), etc.
(*c*) Shock.	(*c*) A matter of considerable speculation; *e.g.*, blows on heart or abdomen may even prove fatal without any trace of organic injury to the viscera. If once signs of reaction (vomiting, returning consciousness, etc.) are observable, shock rarely proves fatal.

And then secondarily on the Chance of—

(*d*) Secondary hæmorrhage. (*e*) Septicæmia. (*f*) Erysipelas, etc., starting in the wound. (*g*) Tetanus.	(*d*), (*e*), (*f*), and (*g*) are almost entirely matters of the impossibility or otherwise of cleaning the wound. Hence punctured wounds from dirty objects and severe crushes with dirt ground in are especially dangerous. The tetanus bacillus is common in dirt apparently. A distinction may fairly be drawn between septic organisms (streptococci, etc.) and more specific ones (such as those of diphtheria, erysipelas, etc.).
Or more remotely (*h*) The effects of scarring (stricture, etc.).	(*h*) Principally in urethra, ureter, œsophagus, and gut, in fact of hollow important structures.

As a general principle the court is only likely to consider those wounds dangerous to life in a legal sense in which the danger is imminent. When the danger is remote, although very real, bail will probably be granted. On these occasions the law appears to contemplate the direct, and not the future or possible, occurrence of danger; if the last view were adopted, it is clear that the most trivial lacerations and punctures might be pronounced dangerous to life, since tetanus or erysipelas, proving fatal, has been an occasional consequence of very slight injuries. A difference of opinion will often exist among medical witnesses as to whether a particular wound is or is not dangerous to life. Unanimity can only be expected when the judgment and experience of the witnesses are equal. The rules for forming an opinion in these cases will, perhaps, be best deduced from the results of the observations of good surgical authorities in relation to injuries. The hints in the table will be of use.

For dying declarations in serious injuries *vide* "Dying Declarations."

For further remarks on the subject *vide infra*, "Did this Wound cause Death?"

Is this Wound likely to leave Permanent Injury?

This question can only arise either in considering compensation in accidental cases (*vide* "Workm. Comp. Act,") or when a judge in considering the sentence (severity or to include compensation), though *intent* is the principal factor in awarding punishment for crimes of this nature. The following short table may be useful, but for fuller discussion and cases *vide* "Insurance."

(*a*) Actual immediate loss of eye, limb, or member.	(*a*) Obvious at once.
(*b*) Probable loss of the same.	(*b*) Judgment much affected by the nature of the wound on general surgical principles—*e.g.*, sympathetic ophthalmia, possible gangrene from damage to vessels, severe injuries to nerves, amount of inflammation, chances of septicæmia, etc.
(*c*) Scarring and its effects: contraction, keloid, etc.	(*c*) *Vide* subject of scars, anchylosis of joints true and false, chances of plastic surgery, etc.
(*d*) Shock and damage to the nervous system, immediate and temporary or remote.	(*d*) The most debatable and difficult subject throughout the whole system of civil medical jurisprudence (*vide* "Insurance" for more remarks).

Wounds of the face, when at all extensive, are always followed in healing by greater or less *deformity*. A medical witness may, perhaps, find these questions put to him in relation to them: Is the wound likely to be attended with deformity? Could such a wound of the face heal without deformity?—or, Could the deformity, if it exist, have been produced by any other cause than the wound? These questions are of

importance. A person may allege that he was severely wounded in the face, when the medical witness, on examination, may find no trace of such a wound as that described. Again, a person may seek damages from another in a civil action by alleging that a particular deformity was produced by a wound, when the medical witness may be able to trace its origin to disease, or to some accidental cause.

Were Wounds or a Wound the Cause of Death?

It is important for a medical witness to bear in mind that in all cases of wounds criminally inflicted the cause of death must be reasonably *certain*. No man ought to be convicted upon mere medical probability. In general there is only *one* real cause of death, although other circumstances may have assisted in bringing about a fatal result. Hence it is our duty, when several apparent causes for death exist, to determine which was the *real* cause, and in stating it to the court to be prepared to offer our reasons for this opinion. In most cases of local injury, when a person dies speedily, there will be no great trouble in settling whether disease or the wound was the cause. A difficulty may, however, exist when a person has recovered from the first effects of a wound, and has subsequently died. Besides, there may be cases in which the cause of death, in spite of the most careful deliberation, will be still obscure; or sometimes it may happen that the death of a person appears to be as much dependent on bodily disease as on an injury proved to have been received at the time he was labouring under disease. How is an opinion to be expressed in such a case? The course which a medical witness ought to pursue, provided he has duly deliberated on the circumstances before he appears in court, and his mind is equally balanced between the two causes, is to state at once his doubt to the jury without circumlocution, and not allow it to be extracted from him in cross-examination. Occasionally many causes of death are assigned by a witness, and in a case of this kind an acquittal is commonly directed.

It cannot be too often repeated, nor too strongly insisted upon, that, however obvious the actual immediate cause of death may be, before legal proof of this being the only cause can be obtained a very complete autopsy must be made. To take the simplest illustration, a man falls in front of a train or heavy waggon and is apparently crushed to death. How without an autopsy are we to prove that it was not a cerebral hæmorrhage which caused the fall, thus possibly dissipating the idea of suicide? *vide* "Coroners' Inquests."

Wildberg was called upon to examine the body of a girl who had died, apparently from the effects of the violence, while her father was chastising her for stealing. On the arms, shoulders, and back many marks of blows were found; and under some of them blood was effused in large quantity. The injuries, although severe, did not, however, appear sufficient to account for sudden death. He therefore proceeded to examine the cavities, and on opening the stomach he found it very much inflamed and lined with a white powder, which was proved to be arsenic. It turned out that on the theft being detected the girl had taken arsenic for fear of her father's anger; she vomited during the flogging, and died in slight convulsions. Upon this Wildberg imputed death to the arsenic, and the man was discharged. A gentleman, having taken eleven grains of strychnine, threw himself out of a window and sustained great bodily injury. The surgeon

finding so much more spasm than could be accounted for by the violence sustained, discovered the real state of the case from the patient's confession. There was also evidence of the purchase of the poison.

The cause of death may be easily assigned in such cases when the circumstances are known; but it is evident that without proper inquiry and great care in conducting examinations after death the apparent may be sometimes mistaken for the real cause. (For some interesting cases and good practical suggestions on this subject see Belloc, "Cours de Méd. Lég.," 148.)

In 1864 an inquest was held at Kilburn on a young man who committed suicide by throwing himself from a window. He lived sufficiently long to inform his medical attendant that he had first taken corrosive sublimate, then cut open his wrist that he might bleed to death, and finding this ineffectual, threw himself from the window.

Even when there may be no suspicion of poisoning, it will be necessary to observe the state of the stomach and its contents—*i.e.*, to determine whether it contains food, the nature of the food, and the degree to which it has undergone digestion.

In *Reg.* v. *Spicer* (Berks Lent Ass., 1846), the falsehood of one part of the prisoner's defence was made evident by an examination of the stomach. The deceased was found dead at the foot of a stair. The prisoner stated that *after* he and his wife had had their dinner he heard a fall. The woman had died instantaneously, and the fall was heard by neighbours at or near the dinner-hour. The stomach was quite empty; there was no trace of food. It was therefore clear that this part of the prisoner's story was untrue, as, had the deceased died immediately after dinner, some portion of undigested food would have been found.

The fact that several days have elapsed since death will not prevent the discovery of food in the stomach provided it had been taken within one or two hours before death, since the digestion of food does not appear to go on to any considerable extent after death. We have thus discovered food in the stomach twenty-eight days after interment. This question connected with the digested or undigested state of the food found in the stomach frequently arises on criminal trials (*vide* "How Long Dead").

A wound may cause death either *directly* or *indirectly*. A wound operates as a *direct cause of death* when the wounded person dies either immediately or very soon after its infliction, and there is no other cause, internally or externally, to account for death. In wounds which cause death *indirectly*, it is assumed that the deceased survives for a certain period, and that the wound is followed by inflammation, pyæmia, tetanus, or some other mortal disease which is a direct, and not an unusual, consequence of the injury. Under this head may be also arranged all those cases which prove fatal by reason of surgical operations rendered imperatively necessary for the treatment of injuries, presuming that these operations have been performed with ordinary skill and care.

It may happen that the wounded person has taken *poison*, and has actually died from its effects, and not from the injuries or maltreatment. Again, a wounded person may have been the subject of subsequent ill-treatment, and the question will arise to which of the two causes his death was really due. It is to be observed of these

cases that the supervening disease, the poison, or the subsequent ill-treatment, should be of such a nature as to account for *sudden or rapid death*, since it would be no answer to a charge of death from violence to say that there were marks of chronic disease in the body, unless it was of such a nature as to account for the sudden destruction of life under the symptoms which actually preceded death. In the medical jurisprudence of wounds there is probably no question which so frequently presents itself as this; it is admitted that the violence was inflicted, but it is asserted that death was due to some other cause, and the onus of proof lies on the medical evidence. Among numerous cases which have occurred in England during twenty years, the author found that the *latent causes of death* in wounded persons were chiefly inflammation of the thoracic or abdominal viscera, apoplexy, diseases of the heart and large bloodvessels, phthisis, ruptures of the stomach and bowels from disease, internal strangulation, and the rupture of deep-seated abscesses. In some of these cases the person was in a good state of health up to the time of the violence, and in others there was a slight indisposition. The history was nearly the same in all; it was only by careful conduct on the part of the medical witnesses that the true cause of death was ascertained.

An imputation has occasionally been thrown on the master of a school when a boy has died soon after he has been punished in an ordinary way, and when there has been no suggestion that an undue amount of violence was used. In such cases there has been commonly some unhealthy state of the body to explain the result. When the disease which gives rise to doubt is seated in a part which is remote from that which sustained the violence, all that is required is that the examination of the body should be conducted with ordinary care. If the disease should happen to be in the part injured (the head or chest), the case is more perplexing. The difficulty can then be removed only by attentively considering the ordinary consequences of such injuries. The violence may have been too slight to account for the diseased appearance; and the disease itself, although situated in the part injured, may be regarded as an unusual consequence of such an injury. On the other hand, the presence of chronic disease will form no exculpation of acts of violence of this nature. In *Reg.* v. *Hopley*, *infra*, there was chronic disease of long standing in the brain of deceased, who was of defective intellect, but it was proved that he was quite well and suffered from no unusual symptoms up to the time that a violent flogging was inflicted, and that this was followed by death in less than three hours from the commencement of the violence. It was not here a question even of acceleration, for the deceased might have lived for years in spite of the existence of this chronic disease.

In some cases slight blows have been followed by fatal consequences even when no disease existed to account for the result.

We have just considered briefly for other purposes the causes in the living of danger in a wound. We must now consider these in more detail, together with several other circumstances bearing on the question now before us:—

1. Death from hæmorrhage.
2. Death from gross injury to important organs.
3. Death from shock.

4. Death at a remote period, or, the wound, indirectly fatal—
 From toxæmia.
 From pathological changes arising from the wound.
 From pre-existent disease.
 From independent disease following injury.
5. Which of two or more wounds caused death?

1. Death from Hæmorrhage.—Loss of blood operates by producing fatal syncope. A quantity of blood escaping from a vessel, although insufficient to cause death by affecting the heart and circulation, may readily destroy life by disturbing the functions of the organ or part into which it is effused. Thus a small quantity effused in or upon the substance of the brain, or at its base, may prove fatal by inducing fatal compression; and, again, if, in a case of wounded throat, blood should flow into the windpipe, it may cause death by asphyxia—*i.e.*, by stopping the respiratory process. In these cases it is obvious that the blood acts mechanically; and in respect to the last condition a medical man, unless circumspection is used, may involve himself in a charge of malpraxis. In wounds of the chest, involving the heart and lungs, death is frequently due not so much to the actual quantity of blood effused, as to the pressure which it produces upon these organs. A few ounces effused into the pericardium will entirely arrest the action of this organ (Friedreich's "Blätter f. Gerichtl. Med.," 1882, p. 163).

The absolute *quantity of blood* required to be lost in order to prove fatal will, of course, vary according to numerous circumstances. The young, the aged, they who are labouring under infirmity or disease, will perish sooner from loss of blood than others who are healthy and vigorous. Females, *cæteris paribus*, are more speedily destroyed by bleeding than males. Infants are liable to die from this cause as a result of slight wounds. An infant has been known to bleed to death from the bite of a single leech, or from the simple operation of lancing the gums. Even the healthy and vigorous, when their vital powers have been depressed by maltreatment or by brutal violence, will sink under the loss of a comparatively small quantity of blood. (See Watson, "On Homicide," p. 90.) A medical jurist must not forget that some persons have a predisposition to excessive bleeding from slight injuries; and this condition is often hereditary. The slightest wound or puncture—the bite of a leech or the extraction of a tooth—will be attended with a loss of blood which cannot be arrested, and which will slowly lead to death by exhaustion. Cases have been frequently recorded of fatal hæmorrhage following the extraction of teeth when there had been previously nothing to indicate the probable occurrence of death from so trivial a cause. The disease known as hæmophilia is now a well-recognised one, though its pathology is but ill understood, and its diagnosis except by results still impossible. Such cases are detected without difficulty, since a surgeon may always infer, from the part injured and the extent of the injury, whether the bleeding is likely to be copious or not. When a person bleeds to death from what would, under common circumstances, be a simple wound, the admission of this fact may in certain cases lessen the responsibility of an accused person.

A *sudden loss* of blood has a much more serious effect than the

same quantity lost slowly. A person may fall into a fatal syncope from a quantity of blood lost in a few seconds which he would have been able to bear without sinking had it escaped slowly. This is the reason why the wound of an artery proves so much more rapidly fatal than that of a vein. Death speedily follows the wound of a large artery like the carotid; but it takes place with equal certainty, although more slowly, from wounds of smaller arteries. In a case in which one of the intercostal arteries was wounded by a small shot, hæmorrhage caused death in thirty-eight hours. The loss of blood which follows the division of the smaller branches of the external carotid artery is often sufficient to destroy life unless timely assistance be rendered.

A case was tried (Berkshire Spring Ass., 1832) in which it was proved that the prisoner had killed his wife by stabbing her in tho leg; a small artery (the anterior tibial) was divided, and the woman died from hæmorrhage half an hour afterwards.

Wounds of arteries, even smaller than these, might in some subjects prove fatal, if no assistance were at hand.

Watson mentions a case in which the internal mammary artery on the left side was divided by a stab in the chest. The woman died on the ninth day, and four pounds of blood were found effused on that side. In another case in which an intercostal artery was divided, six pounds of blood were effused (Watson, "On Homicide," p. 101).

In both cases, as in most wounds of the chest, the blood not only affected the system by its loss, but by compressing the lungs and impeding respiration. Wounds of large veins, such as the jugular, may, from the quantity of blood suddenly lost, speedily destroy life. If a wound is in a vascular part, although no vessel of any importance be divided, the person may die from bleeding. It is difficult to say what quantity of blood should be lost in order that a wound may prove fatal. The whole quantity contained in the body of an adult is calculated at about one-thirteenth of its weight—*i.e*, about twelve pounds. According to Watson, the loss of from five to eight pounds is sufficient to prove fatal to adults. But while this may be near the truth, many persons will die from a much smaller quantity, the *rapidity* with which the effusion takes place having a considerable influence.

Internal Hæmorrhage.—Hæmorrhage may prove fatal, although the blood does not visibly escape from the body. In incised wounds the flow externally is commonly abundant; but in contused, punctured, and gunshot wounds the effusion may take place internally and rapidly cause death. In severe contusions or contused wounds, involving highly vascular parts, the effusion may go on to an extent to prove fatal either in the cavities of the body or throughout the cellular membrane and parts adjacent. Many pounds of blood may thus be slowly or rapidly effused. The most fatal internal hæmorrhages are those which follow ruptures of the organs from violence or disease. Ruptures of the heart, lungs, liver, spleen, and kidneys have thus caused death.

In 1864, a man who had been run over was brought to Guy's Hospital. He complained of pain in the back, but there were no symptoms of severe injury, and no marks of violence were seen on the skin of the back. Ho left the hospital and walked with some assistance to his house. A few hours afterwards he was found dead in bed. On inspoction there was a largo quantity of blood offused in tho

abdomen. This had proceeded from one kidney, which had been ruptured transversely through its whole substance.

In these cases the hæmorrhage may not be immediate. Slight muscular exertion may accelerate it and cause death. In death rom severe flagellation blood may be effused in large quantity beneath the skin and among the muscles; this effusion will operate as fatally as if it had flowed from an open wound.

The means of ascertaining whether a person has died from bleeding by an open wound are these:—Unless the wound is situated in a vascular part, we shall find the vessel or vessels from which the blood has issued divided, the neighbouring vessels empty, and the body more or less pallid, although this last condition is of course liable to be met with in certain cases of disease, as also under copious venesection—points easily determined by an examination. The blood will commonly be found more or less clotted or coagulated on those surfaces on which it has fallen. If, with these signs, there is an absence of disease likely to prove rapidly fatal, and no other probable cause of death is apparent, it may be fairly referred to loss of blood. This opinion may, however, be materially modified in reference to open wounds by the fact of the body not being seen on the spot where the injury was actually inflicted, by the wound having been sponged, the blood removed by washing, and all traces of bleeding destroyed. Under these circumstances, the case must in a great measure be made out by presumptive proof; and here a medical witness may have the duty thrown upon him of examining articles of dress, furniture, or weapons, for marks or stains of blood.

It must not be supposed that all the blood met with round a wounded dead body, or in a cavity of the body, was actually effused during life. As soon as the heart's action ceases the arteries pour out no more; but the blood so long as it remains liquid—*i.e.*, from four to eight or ten hours—and the warmth of the body is retained, continues to drain from the divided vessels. The quantity thus lost, however, is not considerable, unless the veins implicated are large, or the part is highly vascular, *i.e.* full of small vessels. In wounds involving the great vessels of the neck the blood which drains from the wounded part after death may be large.

2. **Death from Great Mechanical Injury done to a Vital Organ.**—We have instances of this becoming a direct cause of death in the crushing of the heart, lungs, or brain, by any heavy body passing over or falling on the cavities, as in railway accidents. The severe mechanical injury is sometimes accompanied by a considerable effusion of blood, so that the person really dies from hæmorrhage; but in other instances the quantity of blood lost is inconsiderable, and the fatal effects may be referred to shock. Sometimes a slight amount of violence may prove fatal. These are, however, to be regarded as exceptional instances.

3. **Death from Shock.**—This is sometimes a direct cause of death under the infliction of external violence; and in this case life is destroyed without the injury being to all appearance sufficient to account for so speedily fatal a result. Savory has suggested that death from shock is nothing more than death from temporary exhaustion of nerve-force, the result of a violent, sudden, and excessive expenditure of it

("Lect. on Life and Death," p. 171). Whatever theory may be adopted to explain it, there is no doubt that a person may die from what is termed shock without any marks of severe injury being discovered on his body after death. We have examples of this mode of death in accidents from lightning, or from severe burns or scalds, in which the local injury is often far from sufficient to explain the rapidly fatal consequences. As instances of this form of death from violence may be also cited those cases in which a person has been suddenly killed by a blow upon the upper part of the abdomen or on the pit of the stomach, which is supposed to operate by producing a fatal impression on the nerves and nerve-ganglia. (*Vide* works on "Physiology.") Whether this be or be not the true explanation, it is admitted that a person may die from so simple a cause without any mark of a bruise externally, or physical injury internally, to account for death. For two very interesting and instructive cases *vide Ed. Med. Jour.*, Feb., 1893, reported by Dr. Templeman. On the skin there may be some abrasion or slight discoloration ; but, as it has been elsewhere stated (*infra*, "With what Instrument Inflicted"), these are neither constant nor necessary accompaniments of a blow. Convictions for manslaughter have taken place when death has been produced under these circumstances. Concussion of the brain, unattended by visible mechanical injury, furnishes another example of this kind of death. A man receives a severe blow on the head ; he falls dead on the spot, or becomes senseless and dies in a few hours. On an inspection there may be merely the mark of a slight bruise on the scalp ; in the brain there may be no rupture of vessels or laceration of substance, and all the other organs of the body are found healthy. In certain railway accidents persons have died under somewhat similar circumstances. There has been no physical indication of a mortal injury, and no cause apparent to account for death. This can be referred only to the shock or violent impression which the nervous system has sustained from the blow or violence. (*Vide* article "Shock" in surgical text-books.) A medical witness must give his evidence with caution in such cases, since it is the custom to rely in the defence upon the absence of any visible *mortal* wound or physical injury to account for death as a proof that no injury was done.

A trial took place (Liverpool Aut. Ass., 1837) wherein several persons were charged with the manslaughter of the deceased by kicking him behind the right ear. The medical witness deposed that there was in this spot the mark of a severe bruise, but there was no injury whatever to the brain, and the body was otherwise healthy. He very properly ascribed death to the violent shock given to the nervous system, and the court admitted that the cause of death was satisfactorily made out. The person who inflicted the wound was convicted.

There is another form of shock, which is of some importance in medical jurisprudence. A person may have received *many injuries*, as by blows or stripes, not one of which, taken alone, could in medical language be termed mortal ; and yet he may die directly from the effects of the violence, either on the spot or very soon afterwards. In the absence of any large effusion of blood beneath the skin, death is commonly referred to exhaustion, but this is only another mode of expression ; the exhaustion is itself dependent on a fatal influence or

impression produced on the nervous system. A prize-fighter, after having during many rounds sustained numerous blows on the body, may, either at or after the fight, sink and die exhausted. His body may present marks of bruises, or even lacerated wounds, but there may be no internal changes to account for death. In common language, there is not a single injury which can be termed *mortal;* and yet, supposing him have had good health previously to the fight, and all marks of disease indicative of sudden death to be absent, it is impossible not to refer his death to the direct effect of the violence. It is a well-ascertained medical fact that a number of injuries, each comparatively slight, are as capable of operating fatally as any single wound whereby some bloodvessel or organ important to life is directly affected. Age, sex, constitution, and a previous state of health or disease, may accelerate or retard the fatal consequences.

A case of a somewhat similar kind may present itself in the punishment of *flagellation*, which is occasionally followed by death, either as a direct consequence of shock, or from indirect causes, such as inflammation and its consequences. At the trial of Governor Wall, the judge directed the jury that the long continuance and severity of pain (in flagellation) may be productive of as fatal consequences as if instruments or weapons of a destructive kind were used. It is not often that scholastic flagellation is a cause of death in this country. One case, however, which excited public attention from the atrocity of the circumstances attending it, was the subject of a trial for manslaughter (*Reg.* v. *Hopley*, Lewes Aut. Ass., 1860).

The evidence showed that the prisoner had beaten a youth of sixteen most severely for nearly two hours with a rope and stick. The external wounds were slight, but an inspection showed that the muscles as well as all the soft parts beneath the skin had been considerably bruised and lacerated, and that there were extensive effusions of blood in the cellular membrane of the arms and legs. There was no mortal wound in the common sense of the term, but there was no reasonable doubt that the boy had died from the violence inflicted on him by the prisoner. His guilt was established by the fact that he had endeavoured to conceal the effects of his violence by removing the marks of blood; that he had covered the body of the deceased with clothing so as to conceal the bruises; that he had procured a coroner's inquest to be held in haste, and, while concealing from the jury the fact that he had beaten the youth on the night of his death, stated that he had found him dead, and suggested that he might have died of disease of the heart. There can be no doubt that the youth died either while the prisoner was inflicting the violence or soon afterwards. No attempt was made to dispute the cause of death. Apart from the depressing effects on the nervous system of long-continued and severe pain, there was, in this instance, such an effusion of blood internally as would account for the production of fatal syncope.

On a trial for murder, which took place in Germany, it was proved that the deceased had been attacked with sticks, and that he had been afterwards flogged on the back with willow switches. He died in about an hour. On inspection there was no mortal wound, nor any injury to a vital organ; there were simply the marks of lacerations and bruises on the skin, apparently not sufficient to account for death; but this was, nevertheless, very properly ascribed to the violence. The case of the Duchess of Praslin, who was murdered by her husband in Paris in 1847, furnishes an additional proof of the fatal effect produced by numerous injuries. On an inspection of the body it was found that on the head, neck, and both of the hands, there were no fewer than *thirty* distinct wounds, some contused and others incised and punctured. There were also the marks of many bruises and the impressions produced by the nails of the assailant's hand over the mouth. For the most part these injuries were slight, and not one could be said to be necessarily mortal. The most serious wound was situated on the right side of the neck; but even here the

carotid artery and internal jugular vein had escaped injury. Death was referred to the loss of blood which had taken place from the numerous wounds inflicted during the struggle with the assassin ("Ann. d'Hyg.," 1847, 2, 377).

From these considerations, it cannot be expected that in every case of death from violence or maltreatment there must be some specific and visible *mortal injury* to account for that event. When the circumstances accompanying death are unknown, a medical opinion should be expressed with caution; but if we are informed that the deceased was in ordinary health and vigour previous to the infliction of the violence, and there is no morbid cause to account for his *sudden* illness and death, there is no reason why we should hesitate in referring death to the effects of a number of injuries. Among non-professional persons a prejudice exists that no person can die from violence unless there be some distinctly *mortal* wound actually inflicted on the body, *i.e.* a *visible* mechanical injury to some organ or bloodvessel important to life. This is an erroneous notion, since death may take place from the disturbance of the functions of an organ important to life without this being necessarily accompanied by a perceptible alteration of structure. For further illustrative cases *vide* "Suicide."

4. **Wounds indirectly Fatal.**—Certain kinds of injuries are not immediately followed by serious consequences; but a wounded person may die after a longer or shorter period, and his death may be as much a consequence of the injury as if it had taken place on the spot. The aggressor is as responsible as if the deceased had been directly killed by his violence provided the fatal result can be traced to the usual and probable consequences of the injury.

Death may follow a wound, and be a consequence of that wound, at almost any period after its infliction. It is necessary, however, in order to maintain a charge of homicide, that death should be strictly and clearly traceable to the injury, and not be dependent on any other cause (*vide* "Malpraxis"). A doubt on this point must, of course, lead to an acquittal of the accused.

It is the law that when a person dies from a wound the assailant shall not be adjudged guilty of homicide unless death takes place *within a year and a day* after the infliction of the wound (Archbold, p. 345). In practice, the existence of this rule is usually of little importance. Most wounds leading to death generally destroy life within two or three months after their infliction; sometimes the person does not die for five or six months, and, in more rare instances, death does not ensue until after the lapse of twelve months, or even several years.

Many cases might be quoted in illustration of the length of time which may elapse before death takes place from certain kinds of injuries, the injured person having ultimately fallen a victim to their indirect consequences.

Alison quotes several cases in which persons have been found guilty of homicide, the injured persons having died from the indirect results of the wounds after the lapse of three and five months, and longer ("Criminal Law," p. 151). In the case of Mr. Smith, who was shot by Ross Touchet (July, 1844), death did not take place until after the lapse of eleven months from the time at which the wound was inflicted. In 1839 a boy was admitted into Guy's Hospital for an injury to the spine which proved fatal only after the lapse of eleven months. Among

reported medico-legal cases, the *longest* interval at which a conviction has taken place from indirectly fatal consequences was *nine months* (*Reg.* v. *Valus*, Devizes Sum. Ass., 1847). It was proved that the prisoner had maltreated the deceased in September, 1846. After this she suffered in her health, and in December she was found labouring under phthisis. She died of the disease in the following May. Two medical men deposed that three ribs had been broken on the left side, and the injury had evidently not been attended to. They thought that the irritation caused by the fracture in September might have led to the development of phthisis, although the seeds of the disease might have been long lurking in the system. The judge left it to the jury as a question depending on medical evidence, and they had to consider whether the consumption was caused, or the death of the deceased hastened, by the violence of the prisoner. They returned a verdict of guilty.

Wounds of the head are especially liable to cause death insidiously. The wounded person may in the first instance recover, he may appear to be going on well, when, without any obvious cause, he suddenly expires. In general an examination of the body will suffice to determine whether death is to be ascribed to the wound or not.

The most extraordinary case in the editor's experience is that of a man upon whom he performed an autopsy in 1887, when he found the metal portion of a penholder embedded in an abscess in the brain. The foreign body had been there upwards of twenty-five years, gaining its position as the result of an accident when the man was a boy at school. No symptoms had been caused at the time, nor subsequently till a few months before death.

A man received a musket-shot in the left side of the chest, and the ball remained lodged in the left lung during a period of *twenty-five years*. The ball in penetrating had fractured the humerus at its neck, in consequence of which the upper extremity had been amputated at the shoulder-joint. The wound of the chest soon healed, but the patient remained during life subject to fits of suffocation and hæmoptysis, under the effects of which he at length sank. On an examination of his body the ball was found lying behind the third intercostal space in the midst of the pulmonary tissue, but lodged in a kind of cyst which communicated with the large air-tubes.

In severe injuries affecting the spinal marrow, death is not an immediate consequence, unless that part of the organ which is above the origin of the phrenic nerves (supplying the diaphragm) is wounded. Injuries affecting the lower portion of the spinal column do not commonly prove fatal until after some days or weeks; but the symptoms manifested by the patient during life, as well as the appearances observed in the body after death, will sufficiently connect the injury with that event.

In discussing the deaths of persons who have recovered from the immediate effects (hæmorrhage, shock, gross injury), we must, for the sake of clearness, classify them in some way, although it is difficult to do so. It seems to the editor that the best classification is into—

Class A.—Cases in which the consequential sequence of events is direct and obvious, *e.g.*, septicæmia.

Class B.—Cases in which the wound produces directly a separate pathological lesion, which in turn (more or less accidentally) proves fatal, *e.g.*, diaphragmmatic hernia, surgical operations, etc.

Class C.—Cases in which another definite pathological condition

was present before the wounding, *e.g.*, cysts or tumours in abdomen, or alcoholism.

Class D.—Cases in which another definite pathological condition arises after the wounding, but is of a totally different nature, and the consequential sequence is, to say the least, very doubtful, *e.g.*, tubercular meningitis after a blow.

Class A.—*Consequential sequences, direct and obvious.* These, again, must be divided into two or three groups.

1. The wound affords the means of entrance of some of the commoner and most ubiquitous microbes, usually termed non-specific, streptococci, staphylococci, etc., which, by the entrance of themselves or of their chemical poisons, or by both means, produce a generalised condition of toxæmia, followed by death.

2. The wound immediately offers a point of entrance to the rarer and more definitely specific micro-organisms, amongst which may be enumerated those of tetanus, erysipelas, anthrax, diphtheria, hydrophobia, etc.

3. The wound itself causes such destruction of tissue that the consequent gangrene of the tissues ultimately leads to death, either with or without amputation. This group would include severe crushes by bruising of the limbs, with rupture of main vessels.

4. The wound (of the trunk) is so severe as to set up inflammation of the underlying viscera (pleura, pericardium, peritoneum, lungs, etc.), or it ruptures a viscus, and so leads to severe illness and death (bladder, intestines, etc.).

5. The wound is in such a situation (severe cut throat, for example), that it cannot be kept aseptic, and secondary pneumonia directly develops from it.

In former editions of this work such causes of death were termed unavoidable. Such a term can certainly no longer be applied to them with our modern knowledge of diseases and their treatment, though, if death has actually occurred, it must be admitted that the term is applicable. The point is, that death is frequently avoidable in such cases by proper treatment.

The power of deciding on the responsibility of an accused person for an event which depends only in an indirect manner on the injury originally inflicted by him rests of course with the authorities of the law. But it is impossible that they can decide so difficult and nice a question in the absence of satisfactory medical evidence; and, on the other hand, it is right that a medical witness should fully understand the importance of the duty here required of him (*vide* "Malpraxis").

When the toxæmia (in its widest sense) can be directly traced to a wound, and there is no other apparent cause of aggravation to which either of these disordered states of the body can be attributed, they can scarcely be regarded by a medical practitioner as unexpected and unusual consequences, especially when the injury is extensive, and seated in certain parts of the body, as in the scalp. If death takes place under these circumstances, the prisoner will be held as much responsible for the result as if the wound had proved directly mortal. This principle has been frequently admitted by our law, and, indeed, were it otherwise, many reckless offenders would escape, and many lives would be sacrificed with impunity. It is, however, difficult to lay

down general rules upon a subject which is liable to vary in its relations in every case; but when a wound is not serious, and the secondary cause of death is evidently due to constitutional peculiarities from acquired habits of dissipation, the ends of justice are probably fully answered by an acquittal. In fact, such cases do not often pass beyond a coroner's inquest.

In December, 1903, Mr. Troutbeck, coroner, made a prolonged inquiry into a death from blood poisoning following upon circumcision. Such cases are rare, but occur from time to time. They come under the eye of the law from the point of view of malpraxis. Dr. Connor, of Oxford Street, reported this case to the editor.

Tetanus is a distinct specific disease, proved to be due to the poison of a bacillus, which itself remains quite locally situated in the wound. It is one of the best illustrations of this form of microbic disease. It is a comparatively rare sequel to wounds, but seems especially liable to occur in even slight ones which have come in contact with the earth.

Brady met with a case in which a man slipped in walking, and fell flat on his back. He was stunned, but able to walk home. He apparently recovered from this simple accident, but on the following day he was attacked with tetanus, and died in seventy hours (*Lancet*, May 15th, 1847, p. 516). In the case of *Reg.* v. *Butcher* (Warwick Lent Ass., 1848) it was proved that the deceased had received a blow on the nose, which caused severe bleeding. In spite of good surgical treatment, the man was attacked with tetanus on the fifteenth day, under which he sank. On inspection it was found that one of the small bones of the nose had been broken, and this had given rise to the fatal attack.

The bacillus occasionally seems to enter the body through wounds which are unnoticed by the victim, and is consequently, but erroneously, said to be spontaneous. In endeavouring to connect its appearance with a particular wound or personal injury, it will be proper to observe—(1) whether there were any symptoms indicative of it before the wounding; (2) whether any probable cause could have intervened to produce it between the time of its appearance and the time at which the violence was inflicted; (3) whether the deceased ever rallied from the effects of the violence. The time at which tetanus usually makes its appearance, when it is the result of a wound (traumatic), is from about the third to the tenth day; but it may not appear until three or four weeks after the injury, and the exciting cause may still be traced to the wound, which may have healed. When resulting from a wound it is generally fatal.

A medical practitioner is bound to exercise great caution before he pronounces an opinion that a fatal attack of tetanus has arisen either from so-called spontaneous causes, or from slight blows or personal injuries inflicted by a second person.

A case occurred in St. Bartholomew's Hospital in 1853 which exemplifies the necessity of making a rigorous inquiry into all the attendant circumstances. A boy æt. 15, while quarrelling with another, received a blow in the back from his companion's fist, and this was followed by a kick, but not of a severe character. He was able to get up and walk home; but in about two hours he complained of stiffness of the lower jaw. He passed a restless night; the stiffness increased; there was great pain, and subsequently difficulty in swallowing. On the second

day he was admitted into the hospital, the pain and stiffness gradually increased, and the jaw became gradually fixed. Spasm of the muscles of the back supervened, occurring in paroxysms, and there was confirmed tetanus. He died on the fourth day after he had received the blow on the back, and apparently from tetanus, as a result of that violence. It turned out, however, on inquiry, that six days previously to the first appearance of the tetanic symptoms the boy had accidentally driven a rusty nail into his foot, and that the suppurating wound which resulted from this injury had only closed on the day on which the blow was inflicted. On an examination of the body a small puckered cicatrix, such as would result from the healing of a punctured wound, was found on the ball of the great toe, and there could be no doubt from the circumstances that this, and not the slight blows struck by the assailant, had been the cause of the fatal attack of tetanus (*Lancet*, 1853, 2, p. 550).

It is probable that many cases have been set down as idiopathic tetanus, in which, by proper inquiry, the disease might have been traced to a concealed wound or some personal injury. In one instance the tetanus was at first considered to be idiopathic, but shortly before death a small black mark was observed on the thumb-nail. On making inquiry, it was found that a few days previous to the attack a splinter of wood had accidentally penetrated the thumb. The patient attached so little importance to the accident that he did not mention the circumstance to his medical attendant. Two similar cases are reported (*B. M. J.*, 1872, 2, p. 594).

Many trials for wounding have occurred in this country in which tetanus was the immediate cause of death; and the defence has generally rested upon the probable origin of the disease from accidental causes. Among these, that of Capt. Moir, who was tried at the Chelmsford Assizes in 1830 for the murder of a fisherman, is one of the most interesting, as it develops the rule of law in respect to criminal responsibility, when death takes place from a secondary cause. The deceased had frequently trespassed on the grounds of the prisoner, notwithstanding warnings. One day the prisoner met the deceased crossing his grounds, in order to pursue his usual occupation of fishing. An altercation took place, and the prisoner, in a state of irritation, rode back to his house, procured his pistols, rode after the deceased, and overtook him in the act of continuing the trespass. Words again ensued between them, and the prisoner then fired at the deceased, and wounded him severely in the arm. The muscles, vessels, and nerves were extensively lacerated, but no question seems to have been raised respecting the propriety of immediate amputation. The deceased lingered a short time, and tetanus supervened, from which he died. On the trial the medical evidence went to show that death was caused by tetanus, brought on by the severe gunshot wound inflicted by the prisoner. In his defence, it was alleged that he shot the deceased under provocation, and that he had not intended to kill him, for he had purposely aimed at his arm. With regard to the first point, it was considered that the fact of his returning to his house to fetch a weapon capable of inflicting a mortal wound, was evidence of deliberate malice; while, with regard to the second point, there could be no extenuation, since a serious wound inflicted on arm or leg may destroy life as certainly as a wound inflicted on the trunk. The prisoner was found guilty and executed. In this case the connection of the secondary cause of death with the original wound appeared to be so clear, that not a doubt existed in the minds of the professional

witnesses; and the law held the prisoner to be as much responsible for the fatal result as if he had killed the deceased on the spot.

Erysipelas, like tetanus, may be a fatal result of slight injuries. Wounds affecting the scalp are liable to be followed by this disease. Burns and scalds may prove fatal either through tetanus or erysipelas as a secondary cause. Some persons are particularly prone to erysipelatous inflammation, and thus wounds, comparatively slight, may have a fatal termination. In *Reg.* v. *Littlewood* (York Sum. Ass., 1858), it was proved that deceased had died from erysipelas consequent on a burn which he had received from an explosion of gas. The cause of death was clearly proved, but the evidence failed to show criminal negligence, and the prisoner was acquitted. On these occasions, in order to make an assailant responsible for the fatal result, the erysipelas must be clearly traced to the injury. The medical facts that the person assaulted has never recovered from the effects of the violence, and that the inflammation set up has suddenly assumed an erysipelatous character, are sufficient to establish this connection. If there has been recovery, and an interval of some days has elapsed, a doubt may arise respecting the connection of the erysipelas with the violence inflicted. This disease is frequently idiopathic, *i.e.*, it appears like tetanus without any obvious wound. In the following case, which was the subject of a trial at the Central Criminal Court in July, 1859, the erysipelas did not show itself until thirteen days after the injury, and it proved fatal on the seventeenth day.

A potman, stated to be of temperate habits, was struck on the left cheek with a quart pot. There was a contusion, but no injury to the skin. The man was slightly stunned by the blow, but was able, in less than an hour, to prefer a charge against the aggressor. From this time he did not appear to suffer any ill effects from the blow, and continued as usual at his work for a period of thirteen days after the receipt of the injury, when erysipelas of the ordinary character made its appearance, commencing on the bridge of the nose and both eyes. Towards the close of the same day the man had an attack of delirium tremens, and on the sixteenth day, the erysipelas began to assume an unhealthy aspect, and he was then taken into hospital. The erysipelas was now general over the face and head, and delirium tremens was strongly marked. Death took place on the following afternoon, and at the post-mortem examination, twenty hours after death, only slight congestion of the brain was found. At the coroner's inquest Clapton was asked whether it was probable (as far as was currently known), that erysipelas could supervene upon a contused wound *thirteen days* after a blow. His reply was in the negative, and he expressed an opinion that the erysipelas could not be attributed to the blow. Hence the death of the man did not result indirectly from the blow, as was sought to be proved. The coroner and the jury disregarded the medical evidence, and committed the man for trial. At the trial the same medical evidence of the cause of death having been given, the recorder immediately directed the jury to acquit the prisoner, stating that there was no evidence to prove that the death had been in any way caused or hastened by the injury inflicted.

Considering the difficulty of proving by which wound the microbe of erysipelas might have entered, the editor doubts if the question could be settled any more decisively now.

It is sometimes difficult to establish the connection of *erysipelas* with a wound, especially when the disease occurs in a remote part of the body not implicated in the wound. When this cannot be distinctly made out, there will be an acquittal.

The following case was tried before the Justiciary Court at Glasgow, in 1822. A gamekeeper was indicted for the murder of a poacher, whom he shot so severely in the left arm that it was found necessary to perform amputation above the elbow. The man died of erysipelas in the right leg; and the question on the trial was whether the erysipelas was brought on by the gunshot wound or not. Upon this question there was great difference of opinion among the medical witnesses. One gave it as his opinion that the debility caused by the wound brought on the disease of which the deceased died. Another thought that the tendency to erysipelas had existed long before the man received the wound. It appeared in evidence that the deceased had been out two nights in the exercise of his vocation, and had slept without shelter; that during this time he had eaten but little; and that he had an ulcer in his leg, the absorption of matter from which, in the opinion of some of the witnesses, had laid the foundation of the disease before the injury was received. As he had received what was thought to be the best mode of treatment in such a case, supposing the deceased had received no wound at all, the prisoner was acquitted of the charge. (Beck's "Med. Jur." : "Wounds.") Taking the circumstances as they are above reported, it certainly did not appear that erysipelas was directly connected with the wound, and unless this had been clearly and satisfactorily proved, it would have been unjust to make the prisoner responsible for the fatal consequences. The bad habit of body and the actual existence of disease in the leg, were facts in themselves sufficient to render such an opinion improbable. But in addition to this, it is stated by Alison, that erysipelas was at the time prevalent in the Glasgow Infirmary, and that the deceased was put into a bed formerly occupied by a patient labouring under this disorder. Until then the wound had presented no peculiarly dangerous symptoms.

A question of a similar kind arose in *Master* v. *The Blackpool Railway Company* (Liverpool Lent Ass., 1868). It was an action for recovery of compensation for the death of the Archdeacon of Manchester. In a collision on the line he received a bruise on the shin. He complained of the injury at the time, and walked lame. In a few days phlegmonous erysipelas set in, and he soon afterwards died of pyæmia. It appeared that his wife was at the time suffering from phlegmonous erysipelas with sloughing sores on the leg, and for two or three days after the injury, the archdeacon slept in his wife's room, and his leg was dressed by the servant who attended the wife. The injury itself appeared at first to be very slight, but after this it assumed a more serious character. On the part of the plaintiff it was urged that the erysipelas which had caused death had supervened naturally on the injury to the leg, while it was contended for the company that the erysipelas was induced by contagion or infection from sitting in the wife's bedroom with the wife, and did not naturally result from the injury. It was left to the jury to say whether or not the archdeacon's sitting in the bedroom was a want of due care, or whether the disease which proved fatal had followed as a natural consequence from the blow. The jury found for the company, on the ground that the plaintiff had sustained no pecuniary loss. [A case of obvious infection through carelessness.—Ed.]

It may, however, become a question for a witness to determine how far the treatment aggravated the effects of the violence, and from his answer to this, the jury may have to decide on the degree of criminality which attaches to a prisoner. For instance, an ignorant person has removed a clot of blood, which sealed up the extremity of a blood-vessel, in consequence of which fatal bleeding has ensued, or he has caused death by unnecessarily interfering with a penetrating wound of the chest or abdomen. It would not be just to hold the aggressor responsible, since, but for the gross ignorance and unskilfulness of his attendant, the wounded person might have recovered from the effects of the wound. When death is really traceable to the negligence or unskilfulness of a surgeon who is called to attend on a wounded person, this circumstance ought to be, and commonly is, admitted in mitigation, supposing that the wound was not originally of a mortal nature. Lord Hale drew a very nice distinction between death as it

results from a wound rendered mortal by improper treatment, and death as it results from improper treatment, irrespective of the wound. In the majority of cases such a distinction could scarcely be established, except upon speculative grounds, and in no case, probably, would there be any accordance in the opinions of medical witnesses. In slight and unimportant wounds, it might not be difficult to distinguish the effects resulting from bad treatment from those connected with the wound, but there can be few cases of severe injury to the person, wherein a distinction of this nature could be safely made ; and the probability is, that no conviction for murder would now take place, if the medical evidence showed that the injury was not originally mortal, but only became so by unskilful or improper treatment. In such a case, it would be impossible to ascribe death to the wound, or to its usual or probable consequences (see below).

If death has been caused by a wound, it signifies not that, under more favourable circumstances, and with *more skilful treatment*, a fatal result might have been averted. As an illustration, the following case, reported by Alison, may be quoted :—The prisoner was one of a party of smugglers who fired at an officer of excise. The wounded man was carried to the nearest village, where he was attended by a surgeon of the country, who was not deficient in attention. A great collection of matter formed in the leg, fever ensued, and the patient died at the end of three weeks. In defence, it was urged that by *skilful* treatment the man might have recovered ; but the court held that it was incumbent to prove that death arose *ex malo regimine*. The true distinction in all such cases is, that if the death was evidently occasioned by grossly erroneous medical treatment, the original author of the violence will not be answerable ; but if it arise from the want merely of the higher skill which can be commanded only in great towns, he will be responsible, because he has wilfully exposed the deceased to a risk from which he had practically no means of escaping.

If the wound had not been likely to produce death, but by unskilful treatment death ensued, then that would not be murder. A man in a quarrel received a bite on his thumb. He went to a quack, who applied some irritating ointment, which led to severe inflammation, and this rendered amputation of the arm necessary. He died from the effects of the operation. There was evidence that the original injury was slight, and would probably have healed but for the improper applications. On this evidence the prisoner was acquitted. (*Reg.* v. *Kingshott*, Lewes Sum. Ass., 1858.)

It will be obvious that a serious responsibility is thrown on practitioners who undertake the management of cases of criminal wounding. Any deviation from common practice should therefore be made with the greatest caution, since novelties in practice will, in the event of a fatal result, form one of the best grounds of defence. On these occasions every point connected with the surgical treatment will be the subject of rigorous inquiry and professional criticism. In the case of a severe lacerated wound in the hand or foot followed by fatal tetanus, it may be said that the wounded person would not have died had amputation been at once performed. In this instance, however, a practitioner may justify himself by showing either that the injury was too slight to require amputation, or that the health or other

circumstances connected with the deceased would not allow of its being performed with any reasonable hope of success. On the other hand, if the practitioner performed amputation, and the patient died, then it might be urged that the operation was premature, unjustifiable, and that it had caused death. Here the surgeon is bound to show that the operation was necessary, according to the ordinary rules of practice. The treatment of severe incised wounds of the throat, when the windpipe is involved, sometimes places a practitioner in an embarrassing position. If the wound is left open, death may take place from bleeding; if it be prematurely closed, blood may be effused into the windpipe and cause death by suffocation.

The following case occurred a few years since in London:—A man inflicted a transverse wound on his throat; it was about four inches in length, and passed across the middle of the larynx. The bleeding was not considerable, as the carotid arteries had escaped being wounded. The external orifice had, in the first instance, been closed, and the patient was almost suffocated, partly by the occurrence of emphysema, and partly by the blood flowing into the windpipe. On opening the wound the patient's breathing was relieved, and a quantity of mucus mixed with blood was thrown out at each expiration. After waiting some time, the pieces of divided cartilage were brought together by sutures, and the wound carefully closed. In a short time the breathing became difficult, the countenance livid, and the man died, apparently suffocated. In 1841, a woman was found in bed one morning with her throat severely cut, and a man was charged with the crime of murder. The wound had divided the windpipe and the superficial vessels. Although medical assistance was called in, it appears that nothing was done to arrest the bleeding for three-quarters of an hour. The wound was then closed by ligatures, and the woman died immediately—most probably from suffocation. The accused was tried and acquitted, because it appeared that this was an act of suicide. The first object of the surgeon, in all such cases, is to save life; therefore the bleeding should be immediately arrested by securing the divided vessels. When this is done, the wound may be closed, but if the closure takes place before this, death from suffocation will commonly follow.

With increased skill in medical practitioners and with the increase in cottage and other hospitals throughout the kingdom, cases where these considerations of proper treatment are concerned are becoming rarer and rarer, but the editor leaves them in the work because he feels that they are still important in our colonies and elsewhere where such opportunities may be lacking.

Again, the wounded person may by his own fault cause an otherwise simple wound to become fatal. A man who has been severely wounded in a quarrel may obstinately refuse medical assistance, or he may insist upon taking exercise or using an improper diet contrary to the advice of his medical attendant; or by other imprudent practices he may thwart the best conceived plans for his recovery. Let us take a common case as an illustration. A man receives a blow on the head in a pugilistic combat, from the first effects of which he recovers, but after having received surgical assistance he indulges in excessive drinking, and dies. The aggressor is tried on a charge of

manslaughter, and found guilty. Death under these circumstances is commonly attributed by the medical witness to effusion of blood on the brain; but it cannot be denied that the excitement produced by intoxicating liquors will sometimes satisfactorily account for the fatal symptoms. In the case which we are here supposing such an admission might be made, and the prisoner receive the benefit of it; for the imprudence or negligence of a wounded person ought not, morally speaking, to be considered as adding weight to the offence of the aggressor. If the symptoms were from the first unfavourable, or the wound likely to prove mortal, circumstances of this kind could not be received in mitigation. Judges are at all times unwilling to admit them. In the case of the notorious Governor Wall, who was convicted for causing the death of a man by excessive punishment, it was attempted to be shown in evidence that the deceased had destroyed himself by the immoderate use of spirits while under treatment in the hospital. The Lord Chief Baron, in charging the jury, observed that no man was authorised to place another in so perilous a predicament as to make the preservation of his life depend merely on his own prudence. The more clearly the medical witness is able to trace death to imprudence or excess on the part of the deceased, in the case of a *slight* wound, the more obviously would the responsibility of a prisoner be diminished; and hence the necessity for attending carefully to the progress of a wound, which, if it prove fatal, may involve another in a criminal charge. In the case of Christian Paterson (1823), referred to by Alison (*op. cit.*, p. 147), it appeared in evidence that the deceased was struck on the head with a smoothing-iron, which fractured her skull; some days afterwards she drank a quantity of whisky, and was ultimately taken to the Royal Infirmary, where erysipelas shortly appeared in the wound, of which she died. Under these circumstances the charge of murder was abandoned, and the accused was found guilty of assault. The legal responsibility of the assailant is the same, whether the deceased die on the spot, or some days, weeks, or months afterwards, unless it can be distinctly proved that his death was immediately connected with the imprudence or excess of which he was guilty, and wholly independent of the wound. But although a prisoner should be found guilty of manslaughter under these circumstances, the punishment is so adjusted by our law as to leave a considerable discretionary power in the hands of a judge. The neglect to call in a medical practitioner, or the refusal to receive medical advice, will not, however, according to the decision in *Reg.* v. *Thomas* (Gloucester Aut. Ass., 1841), be considered as a mitigatory circumstance in favour of the prisoner, even though the wound was susceptible of being cured. A man may receive a lacerated wound of a limb, followed by tetanus or gangrene, and thus proving fatal; he may decline receiving medical advice, or obstinately refuse amputation, although proposed by his medical attendant. This would not operate as a mitigatory circumstance on the part of an assailant, because a wounded person is not compelled to call for medical assistance, or to submit to an operation, and a medical witness could not always be in a condition to swear that the operation would have saved his life; he can merely affirm that it might have afforded him a better chance of recovery. In the case of *Reg.* v. *Hulme* (Liverpool Aut. Ass., 1843), it was proved that the

deceased had died from tetanus caused by an injury to a finger some time before. Amputation was advised by the surgeon, but the deceased would not consent to the operation. The prisoner was convicted of manslaughter, and sentenced to the severest punishment prescribed by the law for that crime. In the case of Mackenzie (1827), the prisoner seized his victim by the throat and bruised him severely in several parts of the body, in consequence of which fatal tetanus supervened. Skilful medical advice was not called in until near the end of the illness, when tetanus had already come on, and in the interval deceased had acted imprudently and had aggravated the symptoms. The medical evidence proved that the tetanus was owing to the injury, and was a frequent result of it. The prisoner, under the direction of the court, was convicted. Again, a person may receive a blow on the head, producing fracture, with great depression of bone, and symptoms of compression of the brain, a surgeon may propose an operation to elevate or remove the depressed bone, but the friends of the wounded man may not permit the operation to be performed. In such a case his line of duty will be to state the facts to the court, and it is probable that in the event of conviction there would be some mitigation of punishment; because such an injury, if left to itself, must in general prove mortal, and no doubt could exist in the mind of any surgeon as to the absolute necessity for the operation. But the neglect or improper conduct of a person who receives a wound thus rendered fatal, does not exculpate the aggressor. During the last few years a great deal has been heard of faith-healing, a subject which properly belongs here, for though the cases are mainly ones of disease, the followers of the sect would presumably apply the same "faith" to the healing of wounds. Moreover, verdicts of manslaughter have been found against parents and guardians in the sect for neglect when children have died without proper medical attention (*vide* "Malpraxis").

Class B.—*The wound produces a pathological condition, which in turn is the proximate cause of death.* It is difficult, if not impossible, to draw a hard and fast line between this group and the last, but there are several cases recorded, such as the following:—

In December, 1903, the editor had under his care a case of intestinal obstruction, which on operation was found to be a diaphragmatic hernia. He died, and a scar was found in the diaphragm, through the yielding of which the hernia had occurred. Inquiry showed that some two years previously the patient had been stabbed through the diaphragm: the assailant was a lunatic and was at the time of the death in Broadmoor Asylum, so that no further steps were taken. A similar case is reported from Edinburgh in former editions of this work, and a few others may be found in medical literature.

Again, in March, 1904, a boy died with gastric ulcer and intestinal obstruction, which on post-mortem examination was clearly traceable to stricture and ulcer, produced by corrosive poisoning swallowed six months previously. The act was suicidal, but had it been homicidal there could have been no doubt about the cause of the death nor of the responsibility for it.

Cases of stricture thus produced are not really very uncommon, nor are cases where an abscess forms, remains for a long time quiescent, and then suddenly assumes active properties, and kills.

In *Reg.* v. *Hynes* (Winchester Sum. Ass., 1860), it was proved that the prisoner had inflicted severe wounds on the head of the deceased, and the death took place two months afterwards. The medical

witnesses were perfectly agreed that death was caused by an abscess in the brain as a result of these wounds. The jury had great difficulty in finding a verdict of guilty, because in their opinion too long a time had elapsed for the injuries to have been the cause of death.

When a person is charged with having caused the death of another through violence terminating in some fatal disease, the case often admits of a skilful defence, and this in proportion to the length of time after the violence of which the deceased dies. The disease, it may be urged, is liable to appear in all persons, even the most healthy; or it may arise from causes unconnected with the violence. In admitting these points, it must be remembered that death may be proved to have been indirectly a consequence of the wound by the facts: 1. That the supervention of the secondary cause, although not a common event, lay in the natural course of things; 2. That there did not exist any accidental circumstances which were likely to have given rise to this secondary cause independently of the wound. The proof of the first point amounts to nothing, unless the evidence on the second point is conclusive.

Surgical Operations.—Apart from the questions of simple negligence (*vide* Section "Malpraxis") (want of antiseptics, etc.), the question of actual operative interference must be considered. In the treatment of wounds, surgical operations are frequently resorted to, and a wounded person may die either during the performance of an operation, or from its consequences. A question may thence arise, whether the person who inflicted the wound shall be held responsible for the fatal result. The law of England regards a surgical operation as part of the treatment, and if undertaken *bonâ fide* and performed with reasonable care and skill, the aggressor will be held responsible, whatever may be the result. The necessity for an operation, and the mode of performing it, will be left to the operator's judgment. As the defence may turn upon the operation having been performed unnecessarily and in an unskilful manner it will be right for a practitioner, if possible, to defer it until he has had the advice and assistance of other practitioners. According to Lord Hale, if death takes place from an *unskilful operation*, performed for the cure of a wound, and not from the wound, the responsibility of the prisoners cease.

Death is by no means an unusual result of severe operations, the secondary consequences under which the patient may die being very numerous, even when the case is most skilfully managed. Sometimes the patient will die on the table, although but little blood may have been lost. Fear, pain, and sudden shock to the nervous system have caused death under these circumstances. The most common indirect causes of death after severe operation are secondary hæmorrhage, erysipelas, tetanus, delirium tremens, pyæmia, and hectic fever with gangrene of the stump [happily all now comparatively rare under modern conditions.—Ed.]. Inspection of the body after death frequently explains the unfavourable result of operations that promise well, by discovering one or more organs in a state of chronic disease, which had not previously deranged the health in a degree sufficient to give notice of its existence, and which might, therefore, have remained quiet for years to come had no extraordinary call been made upon the powers of the system.

Should an operation be unnecessarily or unskilfully performed, the responsibility of an aggressor would, it is presumed, cease, if the death of a wounded party could be clearly traced to it. Thus, if in carelessly bleeding a wounded person the brachial artery should be laid open ("Ann. d'Hyg.," 1834, 2, 445), or if, in performing amputation, a large artery be improperly secured, so that the patient in either case dies from the loss of blood, the prisoner could not be equitably held responsible, because it would be punishing him for an event depending on the unskilfulness of a medical practitioner. According to Platt, B., a prisoner will be held responsible if the original wound were likely to produce death, although unskilfully treated. Supposing the bleeding or amputation to be performed with ordinary care or skill, and yet, in the one case inflammation of the veins, and in the other erysipelas, tetanus, gangrene, pyæmia, or fever should destroy life, the prisoner will be liable for the consequences. The practice of the law is strictly consistent with justice. Should the operation be considered to be *absolutely* required for the treatment of a dangerous wound, which according to all probability would prove mortal without it, should it be performed with ordinary skill, and still death ensues as a direct or indirect consequence, it is only just that the person who inflicted the injury should be held responsible for the result. It is presumed in these cases that, were the patient left to himself, he would, in all probability, die from the effects of the wound. If, therefore, a surgeon, knowing that an operation would give him a chance of saving life on such an occasion, did not perform it, it might be fairly contended in the defence that the deceased had died, not from the wound, but from the incompetency and neglect of his medical attendant. Hence it follows that if, during this necessary treatment, unforeseen though not unusual causes cut short life, no exculpation should be admitted, if it went to attack the best-directed efforts made for the preservation of life (see "Ann. d'Hyg.," 1835, 1, 231).

The facts of the case (*Reg.* v. *Kelly*, Dub. Commis. Court, November, 1871), although made a subject of the most violent contention in a medical, legal, and political view, were really of a very simple kind. On July 12th the deceased received a pistol-shot wound at the back of his neck, and died from the effects on July 16th. The bullet fractured and splintered the atlas, wounding and crushing the soft parts of the neck, and leading to the formation of an abscess in this part. The actual cause of death was inflammation of the spinal cord and its membranes. Stokes considered it necessary to enlarge the wound for the purpose of removing the bullet, which was then supposed to be lying within reach. In this operation a small artery (the occipital) was divided, but the quantity of blood lost was small; the bleeding was stopped by compression, and this bleeding had no influence in causing death. The defence was that the wound would not have proved fatal but for the bad surgical treatment; that the probing of the wound was unnecessary, and that it was unskilfully performed. There was the evidence of experts on both sides; but the facts proved, apart from the opinions expressed, could leave no reasonable doubt that the case had been treated with *bona fides* and with competent skill. The prisoner was positively identified by deceased and others, and yet upon this evidence the jury returned a verdict of not guilty (*B. M. J.*, 1871, 2, p. 716).

The evidence of surgical experts showed that the probing operation performed on the deceased was in strict accordance with the rules of surgery, and that the wound was of such a nature as from the first to be likely to prove mortal in spite of treatment. Subsequently to the trial, nine eminent London surgeons one and all agreed that the bullet-wound in the neck was the direct and sole cause of his death, and that

no blame could be justly assigned to any of those by whom the wound was treated.

Longmore thus expressed himself on this case:—"It would have been acting wrongly had every effort not been made to extract the bullet from the situation in which it was supposed and reasonably inferred to be lodging" (*B. M. J.*, 1871, 2, p. 717).

The failure of justice in this case appears to have been chiefly owing to the fact that the jury were allowed to form their opinions on the surgical treatment pursued, whereas the rule of law is clear as to responsibility. The English practice, as already quoted above, is, that if a man unlawfully inflicts a dangerous wound on another, and the wounded person, after being treated by qualified practitioners, acting *bonâ fide*, and applying themselves with the best of their ability to the case, dies of the wound, the man inflicting it is really guilty of murder, even although an erroneous treatment of the case by the practitioner may have been the cause of death. When an operation is rendered necessary by the previous maltreatment of an injury, the responsibility of an assailant, if the case proves fatal, ceases.

In *Reg.* v. *Kingshott* (Lewes Sum. Ass., 1858), it was proved that prisoner and the deceased fought, and that the prisoner bit the deceased severely on the thumb. According to the medical evidence, the wound would in all probability have healed of itself, or with some slight applications, but it seemed that the deceased went to a corn-leech in the neighbourhood, and he applied a salve to the wound, the consequence of which was that severe inflammation ensued. The deceased then applied to a regular practitioner, who did all that was possible under the circumstances, but the whole arm was in such a condition that it was deemed advisable to remove him to the hospital, where his arm was amputated, and he died from the effects of the operation. For the defence it was contended that the prisoner ought not to be convicted of causing the death of the deceased, inasmuch as it was proved that the original injury was of a slight character, and not at all calculated to produce a fatal result, and that the deceased had conduced to his own death by suffering himself to be treated by an ignorant and unskilful person. The judge held that the charge of manslaughter could not be supported upon the evidence, and he therefore directed the jury to acquit the prisoner.

By an operation being *absolutely required* are we to understand that it should be necessary to preserve life, *i.e.* that the wound would probably prove fatal without it?

From cases hitherto decided it would appear that the law regards three circumstances in death following surgical operations:—(1) the necessity for the operation itself, (2) the competency of the operator, and (3) the fact that the wound was dangerous and would be likely to prove mortal without it. A few cases will serve to illustrate the view taken by our judges of this most important question.

In *King* v. *Quain and others* (Limerick Spring Ass., 1836), Dillon (the deceased) received a comminuted fracture of the leg, produced by blows with a stick. He was taken to a hospital, and it was proposed to amputate the injured leg, but he would not consent. After some days symptoms of approaching mortification made their appearance. All the surgeons agreed that the only chance of saving life was the immediate removal of the leg. The deceased then gave his consent, and the operation was skilfully performed. The injury was inflicted on October 10th; the operation was not performed until November 9th, and Dillon died on the 19th—*i.e.*, ten days after the operation—from tetanus, which, it was admitted, had resulted from the amputation, and not from the wounds inflicted by the prisoners.

For the prisoners it was argued that the deceased did not die of the wounds, as alleged in the indictment, but from the medical

treatment. On the other side it was contended that the injury to the leg was *causa causans*, as the recovery of the patient would have been utterly hopeless without amputation. The judge held (the amputation being considered a necessary part of the patient's treatment) that the death of Dillon, although not proximately, was actually caused by fracture of the leg, and so directed the jury, who returned a verdict of guilty. The disputed point was reserved, and argued before the twelve judges. In addition to the arguments in support of the conviction above given, it was represented as being laid down in the books that if one give a wound to another, who neglects the cure, or is disorderly, and doth not keep that rule which a wounded man should do, yet if he die it is murder or manslaughter, because if the wounds had not been given the man had not died. Although anæsthetics and antiseptics have to an extreme degree altered the circumstances of such operations in modern times, the same principles would hold now as then. The exceptional cases are where death results from the medical treatment; but these are reducible to two classes: (1) when the wound is *not* in itself *mortal*, and the treatment causes the death (*Rex* v. *Macmillan*); and (2) when the death is clearly caused by the *treatment*, either by reason of its being *unskilful*, or not being necessary to save life in the opinion of skilful persons (*Rex* v. *Macewan*). The judges, with one dissentient, ruled the point against the prisoner. In the case under discussion the three conditions requisite for responsibility clearly existed: the operation was absolutely necessary to save life, there was no question as to the competency of the operator, and the wound would, according to all surgical experience, have proved fatal without it. The wounded person may, as in the preceding case, have refused to submit to an operation when in the judgment of a medical man it was necessary to save life, or he may have submitted to it when too late. In *Reg.* v. *Draper* (C. C. C., August, 1872), the prisoner, while carelessly driving a waggon, knocked down the deceased, and a wheel passed over his left arm just above the elbow. The deceased was taken to the Royal Free Hospital, when it was proposed at once to amputate the arm, but he, after consulting with his friends, refused to submit to the operation. The arm was then dressed and put into splints, and the man was told that his life would be endangered if he did not permit his arm to be amputated. A week later he consented to the operation. The arm was removed, but he died of pyæmia, one of the secondary consequences of the operation. In the opinion of the medical officers of the hospital, the man's life would have been saved if he had allowed immediate amputation. Quain, J., told the jury to put out of their minds the question whether death had ensued from the determination of the deceased not to have his arm amputated, as that was a matter of law, upon which, if necessary, he would reserve a case. The question for them to consider was whether, owing to the negligence of the prisoner, the deceased sustained the injury which led to his death. The jury found the prisoner guilty.

In *Reg.* v. *Perrell* (Taunton Lent. Ass., 1847) it was proved that the prisoner had thrown a stone at the deceased, and caused a fractnre of the skull. On a consultation the medical practitioner performed the operation of trephining. The deceased rallied, but he died on the nineteenth day after the injury; and it was found that there was an

abscess in the brain. The medical witnesses referred death to the blow, but admitted that it might have been accelerated by the operation. It was contended in the defence that, although the injury without the operation might have proved mortal, yet that the deceased had really died from the medical treatment. Cresswell, J., observed, that it was admitted the wound was mortal, and that the deceased might have died in a month, but that he had died in less than a week in consequence of the operation. The wound being mortal, if that which was done by the surgeon was what he considered right to be adopted, there would be no question raised upon this point. The prisoners were convicted. Competency for forming a judgment, or for undertaking an operation, implies on these occasions only that average skill and experience which every legally qualified practitioner is presumed by law to possess; and although it is difficult to say whether a man would or would not have died under a particular injury without an operation, yet the law allows a free exercise of judgment, and would not act upon extraordinary exceptions.

Operations under a Mistaken Opinion.—It may happen that the wound is not mortal, and that, although skilfully performed, the operation was *not* necessary to save life; in other words, the wounded person may have died from the immediate results of a serious operation, performed under a mistaken view of the case. It may be alleged by a prisoner's counsel that the operation was not necessary to save life, and that the wounded man might have recovered without it. Lieutenant Seton was killed in the Gosport duel case (June, 1845) (*Reg.* v. *Pym*, Hants Lent Ass., 1846). A tumour formed in the course of the pistol-shot wound received by the deceased at the lower part of the abdomen; and this was supposed by the three surgeons in attendance on the deceased to be an aneurismal enlargement from a wound in, or injury to, the femoral artery, for which it was considered necessary to tie the external iliac artery. The patient died from peritoneal inflammation following the operation; and on inspection it was found that the tumour was formed by a mass of coagulated blood poured out, not from the femoral artery, but from one of its superficial and anomalous branches, which was divided about an inch below Poupart's ligament, and an inch from the main body of the artery. There was some difference of opinion about the necessity for the operation, both as to the time selected for its performance, and as to its being absolutely requisite for the preservation of life. One witness thought that it was absolutely necessary to perform it at the time; while another thought it absolutely necessary, under the circumstances, to save life. In his evidence at the trial, Liston stated that the "tying of the iliac artery was necessary, and that no other operation would have been prudent." It was proposed to cross-examine the medical witnesses in order to show that the wound was not dangerous to life, and the operation not absolutely necessary; but Erle, J., ruled that if a dangerous wound is given, and the best advice is taken, and under that advice an operation is performed which is the *immediate* cause of death, the party giving the wound is criminally responsible.

The point was reserved, but as the prisoner was acquitted of the charge, the opinion of the judges was not taken (*Law Times*, March 21st, 1846, p. 500). The question was subsequently raised

at the trial of the principal in a duel (*Reg.* v. *Hawkey*, Hants Sum. Ass., 1846), but Platt, B., decided in accordance with the opinion of Erle, J., and Rolfe, B. The prisoner was acquitted (*Law Times*, July 25th, 1846, p. 370). This decision stops all inquiry respecting the necessity of an operation, leaving this to the *bonâ fide* judgment of the operator; and it leaves undecided, as in Macmillan's case (*ante*), the question whether the operation was or was not necessary to save life. It was decided in the case of *Rex* v. *Quain* and *Reg.* v. *Pym* that although the indictment alleged that the deceased died of the wound, while in fact he died from the results of an operation, yet it was good in point of law.

A case tried at the Central Criminal Court (*Reg.* v. *Fueling*, 1872) involved some of the points here raised. The prisoner severely kicked the deceased on the right knee. He was able to walk home with much difficulty. Disease set in, and about ten months after the violence amputation of the leg was performed. Ulceration of the stump took place, and the deceased died from secondary hæmorrhage. There was much disease about the leg. It was contended that, notwithstanding the long period which had elapsed, the deceased had died from the unlawful act of the prisoner. For the defence it was suggested that deceased had died from an operation which was not necessary to the treatment. In addressing the jury, Channell, B., said, if a man attacked another and certain results ensued, in the course of which the qualified and competent medical adviser who might be called in took in his discretion a step the termination of which was unsuccessful, and which, perhaps, in the exercise of superior skill would not have been adopted, that termination would not save the man by whom the injury was inflicted from the consequences of his act. He added that in this case they had nothing to do with the question whether or not the offender contemplated the result of his act. The prisoner was acquitted.

The wounds of operation are liable to infection by the same microbes as the original wound, and death may thus occur; it would nowadays almost amount to malpraxis. For cases where definite malpraxis is alleged *vide* "Malpraxis," pp. 80 *et seq.*

Medical Responsibility in reference to the Administration of Anæsthetics.—In a large number [all, not of the most trivial character.—Ed.] of operations it is the general practice among surgeons to administer chloroform vapour or other anæsthetic, not only to allay pain, but to prevent the exhaustion of the patient likely to arise from protracted surgical proceedings. In spite of care on the part of the operator, these vapours are liable to destroy life in an unexpected manner, and the patient may die either before the operation is commenced or during its performance. The facts may leave no doubt that the wounded person died from the anæsthetics, and not from the wound or operation. On inspection of the body the heart may be found in an unhealthy state—a fact which was formerly considered sufficient to account for the fatal effects of the anæsthetic. In a case of this kind, what becomes of the responsibility of the person who inflicted the original wound? No decision has ever been given on this point. Was the use of the anæsthetic in a professional view a *necessary* part of the treatment? Was it skilfully and *properly* administered? Could the diseased

condition of the heart, which rendered the effects of the vapour more fatal than usual, have been detected by the operator, so as to show the impropriety of administering it in this case? These questions should receive satisfactory answers before the aggressor is rendered responsible for death under such peculiar circumstances.

In *Absolom* v. *Statham* (Q.B., November, 1867), an action was brought against a medical man for forcibly administering chloroform to the plaintiff against her will and extracting six of her teeth, also for careless and unskilful treatment, whereby her health was injured. The medical evidence showed that the woman had consented to the operation, and that it had been properly performed; also that her health had sustained no injury by the chloroform or the operation, and that most of her symptoms were due to hysteria. Cockburn, C.J., in summing up the case, said that the two charges or complaints were entirely distinct and different, one being for an assault, and the other for malpractice. The law was clear as to both. No surgeon had a right to perform any operation against the will of the patient *so long as the patient preserved consciousness and will;* and if, therefore, the jury believed the plaintiff's story, then she was entitled to a verdict, although the amount of the damages would depend upon their impression as to the extent of the injury. Then, as to the other ground of complaint, the law was equally clear that every medical practitioner was bound to bring a reasonable amount of skill and care to the performance of the duty he undertook. The jury found for the defendant on both grounds. This shows the state of the law in reference to the responsibility of medical men who undertake operations under chloroform.

Since the above case a very large number of anæsthetics, some of local action, most of them of general action, have been discovered and used for operative purposes. The editor is not aware of any *judicial* rulings on the subject, but the professional rulings and writings are becoming very voluminous. To such an extent has it gone that it has even been suggested that the use of chloroform should be in itself considered malpraxis.

In regard to the examination of patients before administering an anæsthetic, it is unfortunately the case that "it is heart disease without auscultatory evidence" that is more likely to prove fatal than "heart disease with auscultatory evidence."

The reader is referred to Dr. Hewitt's work on anæsthetics for further evidence and criticising of anæsthetics and anæsthetists.

At the June Ass., C. C. C., 1904, a prisoner was sentenced to six months' hard labour under the following rather peculiar circumstances:—As the result of a fracas, a man was brought into the London Hospital late one evening bleeding from a punctured wound in the left forearm. The loss of blood was judged by the house surgeon to be so serious as to necessitate careful examination of the wound under an anæsthetic. During the return to consciousness the patient vomited and choked himself with the contents of his stomach.

For the following notes, taken in court, the editor has to thank Dr. Kidd, who gave the necessary medical evidence:—

"*Rex* v. *Hughes*.—The jury at the inquest brought in a verdict of manslaughter.

"The magistrate at Worship Street Police Court sent him up to the quarter sessions on a charge of manslaughter.

"The grand jury returned a true bill on two indictments:

(i.) Of feloniously killing and slaying one T. Collins, etc.;

(ii.) Of feloniously wounding T. C. with intent to do him grievous bodily harm.

"Judge Grantham tried the case. On the first indictment Mr. J. A. Symonds, for the Crown, started by quoting the case of *King* v. *Holland*, which proved that "if the operation cause death after a man had been attacked it is manslaughter."

"The judge here interrupted and said *King* v. *Mackintyre* (from Cox's 'Cases') was the nearest. Here a man died from effects of brandy given by a surgeon, which went down the larynx, after the man had been wounded.

"(I couldn't gather whether Mackintyre was convicted or not.)

"He then said that in this case he considered the first indictment quite impossible, and must ask the jury to return a formal verdict of not guilty of manslaughter, the prosecution offering no evidence on that count.

"This case is remarkable in that it goes a step further than any previous case where a wounded man has died from the effects of a necessary operation.

"Here it was not the operation, but the anæsthetic, which accelerated the man's death. Now, had not the man misinformed the anæsthetist as to the time of his last meal, which there is no doubt he did, the anæsthetic would have borne no danger to life.

"Therefore it was the dead man's own mistake that caused his death, and the prisoner could not be held responsible for such a misstatement.

"The size of the pieces of meat was very remarkable, showing that the dead man must have eaten more like a wild beast than a man.

"Hughes was then tried on the second indictment, *i.e.*, feloniously wounding with intent to do grievous bodily harm.

"Various evidence given.

"Judge summed up.

"Collins the aggressor, and kicked Hughes' woman in the face when she was lying on the ground.

"Hughes' woman, therefore, eggs Hughes on to revenge.

"Hughes would have been quite right if he had called Collins out and thrashed him.

"Where he went wrong was in using a knife.

"Jury returned verdict of guilty.

"Judge said, seeing that the provocation was so very extreme, he was going to give a light sentence. Would have given no sentence at all were it not that he wished to stop this free use of the knife. Six months' hard labour."

A somewhat similar case occurred at the Liverpool Sum. Ass., July, 1895:—

Owen Green and Mary Ann Roxburgh were charged with the manslaughter of a man with whom the male prisoner was fighting. It appeared, however, that the blow which caused his death, according to the evidence, was given by the female prisoner, and that death was brought about in rather a strange way. According to the evidence, the female prisoner struck the deceased man on the eye with the neck of a bottle after it had been broken. The eyesight was destroyed, and the eyebrow was cut. Under the circumstances it was deemed necessary for the doctors to perform an operation upon the man, and for that purpose they administered an anæsthetic. From his appearance and condition the man appeared to have been a proper subject for an anæsthetic. During the course of the operation, however, he appeared to be in a fainting condition, and he ultimately died—died from the administration of the anæsthetic, and in a way which the doctors are unable to account for. Mr. Justice Cave said in a case of this kind it might be contended

with much plausibility that the person who struck the blow in the first instance, and thereby rendered the operation necessary, was liable for the consequences. But it was not desirable in a case of this kind to let the case rest upon such a principle, and therefore if the grand jury found a *primâ facie* case against the woman he (his lordship) would have a bill drawn charging her with wounding the man with intent to do grievous bodily harm, leaving his death an open question.

The grand jury adopted his Lordship's suggestion, and they were tried for unlawful wounding.

Class C.—*Disease Local or General antedating the Injury.*—It is by no means unusual for individuals who have received a wound, or sustained some personal injury, to die from latent natural causes; and as, in the minds of non-professional persons, death may appear to be a direct result of the injury, the case can only be cleared up by the assistance of a medical practitioner. Such a coincidence has been witnessed in many instances of attempted suicide. A man has inflicted a severe wound on himself while labouring under disease; or some morbid change tending to destroy life has occurred subsequently to the infliction of a wound, and death has followed. Without a careful examination of the body it is impossible to refer death to the real cause. The importance of an accurate discrimination in a case in which wounds or personal injuries have been caused by another must be obvious. A hasty opinion may involve the accused in a charge of manslaughter; and although it might be possible to show on the trial that death was probably attributable not to the wound, but to co-existing disease, yet it must be remembered that the evidence of a surgeon before a coroner or magistrate may be the means of causing the person charged to be imprisoned for some months before the trial. In Guy's Hosp. Rep., 1850, p. 230, will be found two cases in which death from natural causes was wrongly assigned to violence. In one case (*Lancet*, February 15th, 1845, p. 185) the deceased, a boy, died from an *internal strangulation* of the intestine from morbid causes after wrestling with another boy, who might, but for a careful inspection of the body, have been erroneously charged with having caused his death. (For a similar case, see *Med. Gaz.*, vol. 37, p. 702; also Casper's *Wochenschrift*, May 24th, 1845.)

A natural cause of death may be lurking within the body at the time that a wound is criminally inflicted, and a close attention to the symptoms preceding and the appearances after death can alone enable a surgeon to distinguish the real cause. A man may be severely wounded, and yet death may take place from rupture of the heart, the bursting of an aneurism, from apoplexy, phthisis, or other morbid causes which it is here unnecessary to specify (Cormack's *Edin. Jour.*, May, 1846, p. 343). If death can be clearly traced to any one of these diseases the prisoner cannot be convicted of manslaughter, for the medical witness may give his opinion that death would have taken place about the same time and under the same circumstances whether the wound had been inflicted or not.

Such disease may be local, when it is easily discoverable by a skilled pathologist, or it may be a general constitutional predisposition to bad consequences from a wound or injury.

The same point arises in civil cases of insurance against accidents (*vide* Section on "Insurance").

Local Disease Co-existent with Injury.—So a man otherwise healthy labouring under a rupture may receive a blow on the groin, attended with laceration of the intestine, gangrene, and death; another with a calculus in the kidney may be struck in the loins and die, in consequence of the calculus perforating the blood vessels and causing fatal bleeding or subsequent inflammation.

Crosse reported to the Medico-Chirurgical Society the case of a boy, aged ten, who received a slight blow on the abdomen, and died in an unexpected manner on the second day after the injury. On inspection a cyst, capable of holding ten or twelve ounces of liquid, was found connected with the under-surface of the liver. The cyst had been ruptured by the blow, and its contents had escaped into the abdomen. But for the cyst existing in this situation, the blow would not have been attended with dangerous consequences.

In these cases the effects of the violence must be regarded as something unexpected; it would not have produced serious mischief in an ordinarily healthy person, and hence the responsibility of an assailant becomes much diminished. The crime is undoubtedly manslaughter, but the punishment may be of a lenient description. A defence of this kind will, however, be limited by circumstances.

A case is reported in which a Dr. Fabricius was tried at the Old Bailey for the murder of his servant by striking her a blow behind the ear, whereby a large abscess situated at that part was ruptured, and this ultimately caused her death. The chief question on the trial was, whether the deceased had died from the effects of the violence, or from the disease under which she was at that time labouring. The doctor ingeniously urged in his defence that he had struck the blow merely for the purpose of opening the abscess. The jury, however, found him guilty of manslaughter. In the case of *Reg.* v. *Bell and others* (Notts Aut. Ass., 1841), it was proved that the deceased had died from the effects of a blow received in a prize-fight, which had ruptured an abscess in the kidney, evidently of long standing. The prisoners were convicted. In the case of *Bennett* v. *Gredley* (Exch. Sittings, Hilary Term, 1854), which was a suit for compensation by reason of injuries inflicted on a boy's arm, it was argued in defence that the state of the arm was partly owing to a former injury.

In reference to this case the Chief Baron remarked that a man was not bound to have his body in so sound and healthy a state as to warrant an unauthorised assault upon him. A man, therefore, who commits an unauthorised assault upon his fellow-man must take his chance of the effects which such an assault may produce.

In the case of *Reg.* v. *Wallis*, for murder (Cambridge Sum. Ass., 1864), the medical evidence showed that the deceased, an aged lady, had received several wounds and bruises on her face and head, and a severe contusion on the right side of her chest. There was a fracture of the ulna near the wrist, and she had lost much blood. After lying in danger for some days her condition improved, but she again got worse, and died nineteen days after the infliction of the injuries. On inspection it was found that beneath the contusion of the chest three ribs were broken, but not displaced. There was disease of the valves of the heart of long standing, and it was proved that she had suffered from spasms in this region before the assault. The cause of death assigned by the witnesses was spasmodic seizure affecting the organs of the chest, principally the heart. The injuries which the deceased had received had lowered her system, and rendered it less likely that she could recover from a spasmodic attack.

In defence it was urged that if in any case the cause of death be partly traceable to injuries and partly to natural and other causes, a prisoner is entitled to an acquittal. In support of this view the case

of Johnson from Lewis's C. C., vol. 1, p. 164, was quoted. The objection was overruled by Channell, B., who held that it was bad law in the face of recent decisions. There can be no doubt that but for the injuries inflicted the woman would not have died; therefore the act of the prisoner was the moving cause of her death. In cases of a mixed character this is probably the best test to determine the share which the alleged violence, when not strictly of a mortal nature, had in the death of a wounded person. By adopting such a course as was taken on this occasion the cause will be sufficiently defined for the guidance of a jury. As a rule cases of this description are determined by the question whether the violence, although not the immediate, was the accelerating, cause of death.

Numerous internal diseases exist, such as aneurism and various morbid affections of the heart and brain, which are liable to be rendered fatal by *slight* external violence.

A case illustrative of this coincidence was the subject of a criminal trial in the United States in 1842. A man was stabbed by his wife, and he died in about ten minutes. It was supposed that the deceased had died from his wounds, which consisted of two stabs on the right arm and one in the region of the stomach; and the prisoner, who believed that she had caused her husband's death, was charged with the murder. From the medical evidence given at the trial it appeared that there was a large quantity of blood effused in the abdomen, and that the weapon had only perforated the stomach, without dividing any considerable bloodvessel to account for such copious hæmorrhage. It was found that this had proceeded from the rupture of an aneurism of the aorta, the walls of which were so much thinned that the least excitement was, in the opinion of the witness, sufficient to cause the accident. The aneurismal tumour was out of the reach of the knife, which had not penetrated in the direction in which it was lying. The witness admitted that wounds of the stomach were always dangerous, but that sudden death was not a usual consequence of a slight puncture. The prisoner was acquitted. In other instances the case may be of a very doubtful character. A good illustration of this will be found in a case (*Med. Gaz.*, vol. 20, p. 303) where a boy died apparently from the effects of a blow on the side; and after death peritonitis, ulceration of the bowels, an aperture in the diaphragm, and gangrene of the lungs were found. The following case, related by Morgagni, is remarkable in this point of view. An old man was caught in the act of robbing an orchard; he attempted to escape, but while running away the owner struck him a blow on the back. The old man went on a few yards and then fell dead. On inspecting the body there were no external marks of violence. There was a large effusion of blood in the chest, which was traced to a rupture of the aorta, probably from the vessel being in an aneurismal state. The blow appeared to have been slight, and would probably have produced no injurious consequences in a healthy person (Barzellotti, "Questioni di Medicina Legale").

Templemore has recorded two more cases of sudden death—one from emotional inhibition of the heart, the other from shock following a blow on the pit of the stomach—in neither of which would the cause of death have been cleared up had not a careful post-mortem examination been made (*Edin. Med. Jour.*, February, 1893).

In *Reg.* v. *Morris* (Swansea Lent Ass., 1872), the prisoner was convicted of manslaughter under the following circumstances. He struck the deceased a blow on the side of the head, which caused him to stagger and fall. On inspection the heart was found to be in an advanced state of fatty degeneration. It was admitted by counsel for the prosecution that the blow would not of itself have produced any serious injury to a healthy man, but in the case of the deceased it had accelerated his death, and would be likely to do so with a man suffering from heart disease. In the case of a Mr. Wyld (April, 1872), the evidence showed that deceased had received a blow on the head, producing a slight wound, but insufficient to cause, or even, in the opinion of the medical witness, to accelerate, the death of deceased. An inspection showed that there was fatty degeneration of the heart, and that this was the sole cause of death.

The law, as applied to these cases, is thus stated by Lord Hale:—"It is sufficient to prove that the death of a person was accelerated by the malicious act of the prisoner, although the former laboured under a mortal disease at the time of the act." In those cases in which a slight degree of violence has been followed by fatal consequences, it is for a jury to decide, under all the circumstances, upon the actual and specific intention of the prisoner at the time of the act which occasioned death. In most of these cases there is an absence of intention to destroy life, but the nature of the wound, as well as the means by which it was inflicted, will often suffice to show the intention of the prisoner. An accurate description of the injury, if slight, may afford strong evidence in favour of the accused, since the law does not so much regard the means used by him to perpetrate the violence, *as the actual intention to kill*, or to do great bodily harm. Serious injury, causing death by secondary consequences, will admit of no exculpation when an assailant was aware, or ought to have been aware, of the condition of the person whom he struck. Thus if a person notoriously ill, or a woman while pregnant, be maltreated, and death ensue from a secondary cause, the assailant will be held responsible, because he ought to have known that violence of any kind to a person so situated must be attended with dangerous consequences. So if the person maltreated be an infant or a decrepit old man, or one labouring under a mortal disease, it is notorious that a comparatively slight degree of violence will destroy life in these cases, and the prisoner would properly be held responsible (case of *Reg.* v. *Louisa J. Taylor*, C. C. C., December, 1882.) A wound which *accelerates* death, *causes* death, and may therefore render the aggressor responsible for murder or manslaughter, according to the circumstances. The commissioners appointed to define the criminal law on the subject of homicide thus express themselves:—"Art. 3. It is homicide, although the effect of the injury *be merely to accelerate the death* of one suffering under some previous injury or infirmity, or although, if timely remedies or skilful treatment had been applied, death might have been prevented." This is conformable to the decisions of our judges. According to Lord Hale, if a man has a disease which in all likelihood would terminate his life in a short time, and another give him a wound or hurt which hastens his death, this is such a killing as constitutes murder. (Archbold.)

The case of *Reg.* v. *Murton* (Maidstone Wint. Ass., 1862) presents many points of interest in reference to the medico-legal question of the acceleration of death by violence. There was no mortal wound, and the deceased was in an unhealthy state of body. Nevertheless, the prisoner was convicted of manslaughter.

The case of Colonel Gordon proves that very slight causes may lead to death, where there is latent disease of the heart or any other important organ. This case was the subject of a trial at the Chester Lent Assizes, 1854 (*Reg.* v. *Sanders*).

It appeared from the evidence that the accused, who was the conductor of a railway train in which the deceased was travelling, attempted to eject him from a carriage. The deceased resisted, and in the struggle the prisoner struck him on the left arm. The deceased made no further resistance, but sat quietly in his seat. It was soon afterwards perceived that he was dead. The medical evidence showed that there was ossification of the valves of the heart and aorta, that this disease had been of long standing, that the life of the deceased was at all times in great peril,

and that his death might have arisen from the excitement which took place previous to the prisoner laying hands upon him. As it was thus admitted that excitement alone would account for the fatal result, the prisoner was acquitted. There was no *corporeal* injury done to the deceased which could account for death. In 1867 a woman, æt. 73, was charged with causing the death of a pauper, by striking her on the cheek. The deceased became insensible, and died in ten minutes. On inspection, it was found that death had been caused by the rupture of an aneurism of the aorta. The medical opinion was that, although the blow was not of itself sufficient to cause death, it had accelerated a fatal result of the disease.

In another case, which was the subject of a trial (*Reg.* v. *Champlonier*, C. C. C., June, 1854), appearances sufficient to account for death existed in the part which sustained the violence; but the medical witness could not with certainty refer them to the violence. An old man passing along a road was struck on the forehead with a stone thrown by the prisoner. The surgeon stated that there was a contused wound, and that his nose bled profusely. The bleeding was arrested, and on the following day he considered the deceased to be out of danger. At a later period of the day, however, the deceased was seized with an apoplectic fit, from which he did not recover. The appearances in the brain were quite sufficient to account for death; but he could not undertake to say that the injury by the stone had in any way produced these appearances. Upon this evidence the supposed connection of the death with the violence was at once set aside as too remote, and the prisoner was discharged.

On these occasions, one of the following questions may arise:—Was the death of the person *accelerated* by the wound, or was the disease under which he was labouring so aggravated by the wound as to produce a more speedily fatal termination? The answer to either of these questions must depend on the circumstances of each case, and the witness's ability to draw a proper conclusion from these circumstances. The maliciously accelerating of the death of another already labouring under disease by an act of unlawful wounding is criminal; for in a legal sense that which accelerates, causes. In *Reg.* v. *Timms* (Oxford Lent Ass., 1870) it was proved that the prisoner had struck the deceased some blows on the head with a hatchet. In twelve days, under treatment, he had partly recovered from the effects, but in six weeks afterwards he was seized with inflammation of the brain with convulsions, and died. On inspection, disease of the kidneys was found, of which there had been no symptoms. Death was referred to this disease, and inflammation of the brain as the result of the blows. The judge directed the jury that if they believed the blows conduced in part to the death of the deceased, it was manslaughter, notwithstanding that other causes combined with the blows to account for death. The prisoner was convicted.

Lord Hale, in remarking upon the necessity of proving that the *act* of a prisoner caused the death of a person, says:—"It is necessary that the death should have been occasioned by some corporeal injury done to the party by force, or by poison, or by some mechanical means which occasion death, for although a person may, *in foro conscientiæ*, be as guilty of murder by working on the passions or fears of another, and as certainly occasion death by such means, as if he had used a sword or pistol for the purpose, he is not the object of temporal punishment." Several acquittals have taken place in cases in which the death of parties have been occasioned by terror, or dread of impending danger, produced by acts of violence on the part of the prisoners; not, however, giving rise to bodily injury in the deceased. Conformably to Lord Hale's view, the Criminal Law Commissioners, in their report

on the subject of homicide, state:—"Art. 1. The law takes no cognisance of homicide unless death result from *bodily injury* occasioned by some act or *unlawful omission*, as contradistinguished from death occasioned by an influence on the mind, or by any disease occasioned from such influence." "Art. 2. The terms 'unlawful omission' comprehend every case where any one being under legal obligation to supply food, clothing, or other aid and support, or to do any other act, or make any other provision for the sustentation of life, is guilty of any breach of such duty." Under the statute (1 Vict. c. 85, s. 2) it appears from the following case that physical injury only is intended. In *Reg.* v. *Grey* (Huntingdon Lent Ass., 1857) the prisoner was indicted for causing a bodily injury dangerous to life—to wit, a congestion of the lungs and heart, with intent to murder. It appeared that she had exposed her child to cold and wet, and that congestion or inflammation of the lungs was a result of such exposure. Erle, J., held that the statute under which the indictment was laid contemplated the infliction of some wound or visible injury to the person. The woman was found guilty; but the point having been reserved, the conviction was quashed by the Court for Crown Cases Reserved, on the ground that, looking to other offences provided for in this statute, this case did not come within it. In *Reg.* v. *Percival* (Midland Circ., March, 1857), a man was charged with the manslaughter of deceased by causing his death by fright, *i.e.*, by personating a ghost. The evidence showed that the boy had sustained no physical injury, but he had received a shock from which he did not recover. Wightman, J., held that in his view the case would fall within the definition of manslaughter. Under the 14 & 15 Vict. c. 100, the necessity for tracing death to some *corporeal* injury appears to be practically abolished. According to the fourth section, in any further indictment for murder or manslaughter it shall not be necessary to set forth the *manner* or the *means* by which the death of the deceased was caused.

It seems to the editor that 24 & 25 Vict. c. 100, "by any means whatsoever cause grievous bodily harm," is meant to cover these doubtful cases.

General Conditions of the Constitution aggravating the Injury.—Comparatively slight wounds sometimes prove indirectly fatal, owing to the person being in an unhealthy condition at the time of their infliction; and compound fractures, or slight wounds, which in a healthy person would have a favourable termination, are followed by gangrene, fever, or erysipelas, proving fatal. Here the responsibility of an assailant for the death may become reduced, so that, although found guilty of manslaughter, a mild punishment might be inflicted. The consequence may be, medically speaking, unusual or expected, and, but for the circumstances wholly independent of the act of the accused, would not have been likely to destroy life. In general, in the absence of malice, this appears to be the point to which the law closely looks, in order to make out the responsibility of the accused, namely, that the fatal secondary case must be something not unusual or unexpected as a consequence of this particular injury. The medico-legal question presents itself under this form: Would the same amount of injury have been likely to cause death in a person of ordinary health and vigour? Men who have suddenly changed their habits of living,

and have passed from a full diet to abstemiousness, are sometimes unable to bear up against comparatively slight injuries, and often sink from the secondary consequences.

Again, if the person have his constitution so broken by dissipated habits, a wound which otherwise would probably have been of no consequence may easily become fatal; or, on the other hand, the wound and its attendant troubles may be the exciting cause of a fatal attack of delirium tremens, this being a disease which frequently presents itself as a secondary consequence of injuries to persons of intemperate habits. The injury may be slight or severe; the disease will equally supervene and may prove fatal. It is observed occasionally as a consequence of operations required for the treatment of wounded persons. In the case of *Reg.* v. *Heywood* (C. C. C., October 29th, 1846), it was proved that the deceased had been assaulted by the prisoner, but had not sustained any personal injury likely to be followed by serious consequences. Nevertheless, symptoms of delirium tremens came on, and he died in the course of a few days. It was alleged that the disease of which the deceased died was brought on by the violence, and the evidence of Coulson was adduced in support of this view. He was called upon to attend the deceased on the day after the assault. His face was swollen and black, particularly on the right side, and there were two wounds on that side of the face. He did what was necessary at the time, and the wounds were nearly healed. The deceased appeared to suffer from great tremulousness and weakness, and these symptoms continued to increase, although the wounds were rapidly healing, and the swelling had nearly subsided. Two days before his death the ordinary symptoms of delirium tremens came on, and of this he died. In his opinion death was attributable to a shock of the nervous system, causing delirium tremens; and he accounted for that shock by the attack made upon the deceased, and by the blows he had received. On a post-mortem examination he could not discover any fracture of the skull or of the bones of the face, or a rupture of any blood-vessel. The lungs were congested; the heart was large and flabby. He considered that the delirium tremens arose from the attack made upon the deceased, but he was surprised to see so fatal a result from such slight injuries. Delirium tremens was the result of violent injury, but he had known it to follow from slight blows. The deceased was a "bad subject." The injuries he had received were certainly not sufficient to account for the death of a healthy man. The shock to the system might have been produced by the deceased's excited condition, and delirium tremens might be occasioned by excitement alone; but, as there had been blows in this case, he thought it more natural to ascribe it to them than to mere excitement. The skull of the deceased was remarkably thin, and if there had been any great violence he should have expected to find the bones fractured. If the system had not been in a bad state, the result would not have been so serious; but he considered the blows to have been the exciting cause of death. He would not undertake to say, that the deceased would not have died from the excitement alone, even if he had not received any blows. The blows and the excitement together were, no doubt, the cause of death. A second medical witness said, that in his opinion, the deceased's death was the result of his excited state, and that delirium tremens was thereby occasioned, and

not by the blows he received. He described the liver and kidneys of the deceased as presenting the appearance of those of a person addicted to drinking spirits or beer. It was contended that there was no distinct proof of the actual cause of death, or that the disease of which the deceased died had been brought on by the wounds, and the prisoner was acquitted (*Med. Gaz.*, vol. 38, p. 811).

Cases such as this show the importance of a medical witness being well acquainted with the post-mortem appearances which are produced in organs by alcohol, for it may well happen that clinical evidence of an actual attack of delirium may be unavailable.

Under, "With what Weapon Inflicted," will be found some other references to disease of this general nature, hæmophilia, etc.

The following case occurred to the editor in 1903 :—

A medical man who, unfortunately, was known to be addicted to alcohol but by dint of taking much exercise was able to keep the effects at bay for many years, met with an accident to his back which compelled him to do his work in a carriage. During this time he had a smart attack of diarrhœa, which confined him to the house; he died suddenly shortly after obtaining relief from the bowels. A very thorough post-mortem was made by four medical men, of whom the editor was one. No definite cause was found to which death could be attributed, but there was sufficient evidence to show that he had met with his alleged injury, his organs showed in some degree the effect of his habits. His relatives had instituted a claim for compensation, but upon the results of the autopsy the claim was dropped, against the advice of the editor.

The case as it stands is, unfortunately, inconclusive, but it is a very typical one of the difficulties that are constantly appearing in the path of medical witnesses. Had a criminal charge instead of a civil claim been dependent upon the result, decisions in other cases would seem to show that a defendant would have been fully responsible ; but in civil cases "contributory negligence" is a point left to a jury to determine, and they frequently assume that chronic alcoholism exonerates people from claims for such compensation.

The question of *Fragilitas ossium* (*vide infra*) arose in a trial (*Reg.* v. *Dowde*, Norwich Sum. Ass., 1842). The prisoner, a policeman, was charged with manslaughter. The deceased, it appears, attempted to escape from the custody of the prisoner; and the latter, in endeavouring to prevent his escape, struck the deceased a blow on the head. The deceased spoke of the blow as trifling, and, with the exception of a slight headache, he made no complaint. There was a slight cut, with a small effusion of blood. The deceased was placed in a cell, and some hours afterwards was found dead. On inspection, the skull was found fractured for an inch and a half beneath the seat of violence, and a quantity of blood had been effused and had caused death. The medical evidence on the trial was to the effect that the blow did not appear to have been violent, that the skull of the deceased was preternaturally thin, not being more than one-twelfth of an inch in thickness at the fractured part. All agreed that a fracture might in this case have been caused by a blow, which, under ordinary circumstances, would have been attended with no serious mischief. In some persons, all the bones of the body are unusually *brittle*, so that they are fractured by the slightest force. Inflammation, gangrene, and death may follow, when no considerable violence has been used; but these being unexpected consequences, and depending on an abnormal

condition of parts unknown to the assailant, his responsibility may not, *cæteris paribus*, be so great as under other circumstances. This condition of the bones can be determined only by a medical practitioner. Facts of this kind show that the degree of violence used in an assault cannot always be measured by the effects, unless a careful examination of the injured part is previously made.

Class D.—*A specific disease apparently totally unconnected with the wound arises subsequently to it.*

It is necessary to notice this group, because occasionally this sort of case arises: A schoolmaster boxes a boy's ears, severely or lightly; the boy subsequently complains of pain in the head and dies within a week or two. At the autopsy meningitis is found. Was it or was it not the result of the blow? If it can be shown definitely that the meningitis be tubercular, the case must fall to the ground, for it is inconceivable that a blow on the ear can start a tubercular meningitis, which is known to be the result of a very definite bacillus. If, on the other hand, no tubercles are found (in some cases a very careful search is required to find them), the case becomes very perplexing to a medical jurist, for even if middle ear disease be found it is very difficult to say what exactly was the part played by the blow; and, again, if no antecedent disease be found in the middle ear or chest or elsewhere, it seems difficult to avoid the conclusion that the blow did cause the meningitis, however improbable bacteriology would tell us such a result would be.

The editor can personally vouch for the correctness of the following data:—

A man, George Brown, æt. 68, was admitted under his care into the London Hospital on April 8th, 1904, suffering from glycosuria. He was perfectly well until August 2nd, 1903, when he met with an accident in the shape of a blow on the head, and from the next day his urine contained sugar. The evidence was not shaken by close cross-examination, and satisfactorily proved that the glycosuria was definitely due to the head injury.

A case came under the editor's notice a few years ago in which a man knocked his mother about and then turned her out of doors in very inclement weather. She developed pneumonia and died very rapidly. No action was taken, but in a similar case action might be taken, and it might certainly be held that the ill-treatment was distinctly a predisposing factor in the subsequent disease.

Which of Two Wounds caused Death.

It is possible that a man may receive *two wounds* at different times, and from different persons, and die after receiving the second: in such a case, the course of justice may require that a medical witness should state which wound was the cause of death (*vide infra*). Let us take the following illustration:—A man receives during a quarrel a gunshot wound in the shoulder. He is going on well with a prospect of recovery, when in another quarrel he receives a severe penetrating wound in the chest or abdomen from another person, and after lingering under the effects of these wounds for a longer or shorter period, he dies. If the gunshot wound was clearly shown to have been the cause of death, the second prisoner could not be convicted of manslaughter: or if the stab were

evidently the cause of death, the first prisoner would be acquitted on a similar charge. It might be possible for a surgeon to decide the question summarily, when, for instance, death speedily followed the second wound; and on inspection of the body, the heart or large vessel is discovered to have been penetrated; or, on the other hand, extensive sloughing, sufficient to account for death, might take place from the gunshot wound, and on inspection, the stab might be found to be of a slight nature, and not involving any vital parts. In either of these cases, all would depend upon the judgment of the medical practitioner; his evidence would be so important that no correct decision could be arrived at without it; he would be, in fact, called upon substantially to distinguish the guilty from the innocent. On some occasions death may appear to be equally a consequence of either or both of the wounds; in which case, probably both parties would be liable to a charge of manslaughter (see "Ann. d'Hyg.," 1835, 2, 432). The second wound, which is here supposed to have been the act of another, may be inflicted by a wounded person on himself, in an attempt at suicide, or it may have had an accidental origin. The witness would then have to determine whether the wounded person died from the wound inflicted by himself or from that which he had previously received (see "Tetanus").

It is sometimes a difficult question to decide on the relative degree of mortality of several wounds, and on the share which they have had respectively in causing death. By a wound being of itself *mortal*, we are to understand that it is capable of causing death directly or indirectly, in spite of the best medical assistance. It is presumed that the body is healthy, and that no cause has intervened to bring about or even accelerate a fatal result. The circumstance of a person labouring under disease when wounded in a vital part, will not, of course, throw any doubt upon the fact of such a wound being necessarily mortal, and of its having caused death. If there should be more wounds than one, it is easy to say, from the nature of the parts involved, which was likely to have led to a fatal result. In order to determine, on medical grounds, whether a wound was or was not mortal, we may propose to ourselves this question: Would the deceased have been likely to die at the same time, and under the same circumstances, had he not received the wound? There can obviously be no general rule for determining the mortal nature of wounds. Each case must be judged by the circumstances which attend it. The *effect* of the wound, and the *intent* with which it was inflicted, are looked to: its anatomical relations, which must depend on pure accident, are never interpreted in the prisoner's favour.

When was this Wound or Bruise Inflicted?

This question may very easily, and does very frequently, arise in criminal cases (not necessarily in charges of wounding, but in charges of burglary, robbery, etc.), when prisoners assert that a wound, either on themselves or their victims, was caused in an innocent way on a date that does not agree with the theory of the prosecution as to how or when it arose.

It cannot be definitely answered within very narrow limits, but a

medical jurist is expected to be able to say whether the state of the wound is consistent with the sworn facts of time, making allowance for the exceptions with which experience has made him familiar. So much depends on the nature of the wound and the instrument producing it (from a sharp scalpel to the buffer of a train or a cart wheel), that very exact determination of the age of a wound is impossible, but it may be said that small clean wounds will scab over in from ten to twenty-four hours; signs of inflammation in such as are (surgically) dirty will be very apparent in from twenty to forty hours after infliction, and towards the later limit pus will be evident; granulation tissue of appreciable extent will rarely be seen within a week. When once suppuration has been established in a wound, the wound may keep on suppurating for an indefinite time without much sign of healing; in such a case, therefore, the limits will have to be very wide indeed, in fact useless for medico-legal purposes, within which such a wound was inflicted; if parts of it show signs of scarring, these parts may enable a narrower limit to be fixed. It must not be forgotten that in some cases, especially in flabby and anæmic people, a wound may show no trace of healing for several weeks.

In bodies long dead, there may be some difficulty in distinguishing the effects of gangrene in a wound from those of putrefaction. Gangrene implies the death of a part in the living body, and putrefactive changes take place in the dead part, as in the entire dead body. If changes resembling those of gangrene are found in a wounded limb, while the rest of the body is not in a putrescent state, there may be some reason for the opinion that there was gangrene during life. In this case, however, due allowance should be made for the more rapid decomposition of wounded parts. The best evidence will be that which shows the actual condition of the injured part in the living body. If putrefaction is advanced, the opinion of a person who has not seen the deceased while living can be little more than a conjecture.

For the age of a scar, *vide* "Scars."

The answer to the question in the case of a bruise must be given also with some caution. The changes which take place in the colour of a bruised spot will serve to aid the witness in giving an opinion on the probable time at which a contusion has been inflicted. After a certain period, commonly in eighteen or twenty-four hours, the blue or livid margin of the spot is observed to become lighter; it acquires a violet tint, and before its final disappearance it passes successively through shades of a green, yellow, and lemon colour. During this time the spot is much increased in extent, but the central portion of the bruise which received the violence is always darker than the circumference. These changes are due to changes in and absorption of the blood pigment. The colour is finally entirely removed by the absorption of the effused blood. The extent and situation of the bruise, the degree of violence by which it has been produced, as well as the age and state of health of the person, are so many circumstances which may influence the progress of these changes. Thus a bruise is longer in disappearing in the old than in the young. Watson found effused blood in a bruise in an old person five weeks after the infliction of the injury. Where the cellular membrane is dense, the bruise,

cæteris paribus, is not so rapidly formed; nor, when formed, do the above changes take place in it so speedily as when the blood is effused into a loose portion of membrane like that surrounding the eye or existing in the scrotum. In some instances a bruise has been observed to disappear without undergoing changes of colour at its margin. On examining a bruised portion of skin which has suffered from a severe contusion, we find that the discoloration affects more or less the whole substance of the true skin, as well as the cellular membrane beneath it.

These remarks in general hold good for superficial bruises where there is no great quantity of blood poured out; if, on the other hand, there has been a copious outflow of blood which has been able to coagulate into a clot of some size, absorption of the clot with a *restitutio ad integrum* of the affected tissues is a process of very uncertain duration. In May, 1896, the editor performed an autopsy on a man somewhat advanced in years, who four weeks previously had broken a bone in his leg; the ends of the broken bone were quite smoothed off by absorption, but round them was a large, still apparently quite recent, clot of blood. In this case he felt that it would have been impossible to state the date of the fracture, even approximately from the condition of the blood clot; the smoothness of the broken ends of the bone strongly suggested a probable duration of at least, say, two or three weeks, but there was no callus.

In fractures of bones it is the average experience to find some amount of callus (callus is the cementing material thrown out between the ends of a broken bone, which gradually hardens) in about ten or twelve days, if then callus is felt the fracture is probably of this duration at least, but if none be found (as in the above case, at the end of four weeks), it is impossible to state in the living (or even in the dead, *vide post*) what is the age of a fracture. If callus is present, we may form some idea of the age of a fracture by the hardness and firmness of this substance; six weeks to two months is the average period for it to undergo a complete (so far as it can be ascertained in the living) conversion into material as hard as bone. Once a fracture has acquired genuine bony union there is no possible chance of ascertaining its age. The editor has a personal friend whose foot was smashed by a bullet in the Boer War in 1901; there is complete bony union throughout, but it is still (in 1904) very painful when any pressure, as in walking, is placed on it.

In dislocations the only chance of estimating their age is the possible one of a bruise being present, the colour of which may give some little indication. This is a comparatively slight chance, and if the blood has escaped very deeply amongst the tissues it may not come to the surface for a long time (or even never appear at all), and give therefore a false estimate of the date of the injury.

A case very much to the point occurred in 1889 to Dr. Oliver, to whom the editor is indebted for notes.

The prisoners had committed, or were rather alleged to have committed, a burglary at Muswell Hill. Circumstantial evidence showed that whoever committed the burglary, he or they had escaped through some thorny bushes, and had also probably bruised themselves in

efforts to escape; two men were brought to Dr. Oliver for the purpose of being examined (*vide* "Examination of the Person") as to the date and origin of certain wounds on them.

Dr. Oliver, police surgeon of the H Division, said—I examined Clarke on Thursday last. I found a slight discoloration of the skin, measuring an inch and a half long and half an inch wide, on his right shoulder—recent; not more than forty-eight hours' old. I found several scratches on the right wrist and hand, all recent. On the face I found a scratch measuring an inch and a half long. With one exception all the wounds were of a similar character and of recent date. They had the appearance of having been done by bushes. I examined Lyster to-day. I found several scratches on the inner side of his right wrist. One of these is half an inch in length, and the others are pricks, eleven in number. There were ten slight scratches across the knuckles, and there were two broader and deeper than any of the others on the back of the right index finger, but on the left wrist there was a scratch one inch long. The scratches corresponded in age with those on Clarke, and had the appearance of having been caused by bushes.

These wounds, scratches, and pricks became very material evidence in the case.

With what Weapon, or how was the Injury Inflicted?

A. **Evidence from the Wound itself.**—It is not necessary to prove that a weapon has been used for the production of a wound, for the words of the statute are:—"Whosoever shall, *by any means whatsoever*, wound or cause any grievous bodily harm to a person," etc.; yet evidence of the use of a weapon in case of assault may materially affect the amount of punishment awarded on conviction. When, upon the clearest evidence, it is certain that a weapon has been used, it is not unusual for prisoners to declare that no weapon was employed by them, but that the wound had been occasioned by accidental circumstances. A witness should remember that he is seldom in a position to swear that a particular weapon produced at a trial must have been used by the prisoner. He is only justified in saying that the wound was caused either by it or by one similar to it. Schwörer relates the following case:—A man was stabbed by another in the face, and a knife with the blade entire was brought forward as circumstantial evidence against him, the surgeon having stated that the wound had been caused by *this* knife. The wounded person recovered; but a year afterwards an abscess formed in his face, and the broken point of the real weapon was discharged from it. The wound could not therefore have been produced by the knife which was brought forward as evidence against the prisoner at the trial ("Lehre von dem Kindermorde"). Although the criminality of an act is not lessened or impugned by an occurrence of this kind, it is advisable that such mistakes should be avoided by the use of proper caution on the part of a witness, since this generally implies malice, and in most cases a greater desire to injure the party assailed than the mere employment of manual force.

When a weapon is produced there is practically no difficulty in answering the question, "Could this weapon have inflicted this wound?" but the difficulties immediately begin when no weapon is forthcoming, and the witness's opinion is to be founded on an examination of the wound only.

There are one or two fundamental properties of the skin which

have a very important bearing upon our subject in cases where this membrane is involved.

(*a*) The skin is elastic, and is in a living healthy state slightly on the stretch in all directions parallel to its surface. It therefore follows that in punctures with a *blunt* instrument the hole must be as a rule a little smaller than the diameter of the weapon, for the skin yields by stretching without tearing round the actual breach of continuity. [An experiment with say a lead pencil on a piece of sheet indiarubber will well illustrate the point.] If the weapon be sharp at its point, but blunt elsewhere, the inequality may be even greater between the orifice and the weapon. Similarly in incised wounds the tension will draw the edges apart, so that the aperture has no relation at all to the width of the cutting edge. A stab with a double-edged weapon may show a complete diamond-shaped aperture, while one with a single edge and blunt back may show a half-diamond shape, thus :—

Fig. 23.



Wound of single-edged knife. Wound of double-edged knife.

(*b*) The skin is movable on the subcutaneous tissues ; it is flexible, fairly tough, and somewhat sticky. It follows then that when an edged weapon is drawn across the skin we may get several cuts from one action, separated from one another by small bridges of uncut skin, where it got folded on itself. (Even with a sharp knife the skin may be thus dragged, for, however sharp it is, it always has some projecting points, which may catch, and with jagged and blunt knives this is true in an exaggerated degree.) Its stickiness and the jaggedness of the weapon explain the inversion and eversion of the edges of a stab wound, showing the direction of the last force used.

We must now consider in slight detail the various forms of wounds, applying the above principles.

1. *Incised Wounds.*—The sharpness of the instrument is to some extent in proportion to the cleanness and regularity of the edges ; it may also be judged by the amount of blood effused, if this be known, for it is well-recognised that a vessel cut cleanly is more apt to bleed freely than one which has been torn across. Cases are known in which a limb has actually been avulsed with scarcely any bleeding, and torsion of a vessel is a well-recognised method of checking hæmorrhage from it. It must be admitted, *per contra*, that an artery only half severed bleeds more freely than one completely cut across, for it cannot retract nor contract.

The length of an incised wound, of course, gives no hint of the length of the cutting edge. The mere point of a knife may be drawn a long way down or across limb or trunk.

2. *Punctured Wounds.*—By a punctured wound is understood a wound produced by some body being driven straight in through the skin, as opposed to a cutting edge being drawn across the skin.

The depth of a stab is one of the most important points to note, for it will give a clue often to the length of the instrument used, though it

must be remembered that if driven in with much violence the compression of the tissues may allow of a penetration apparently deeper than the length of the weapon.

A trial for murder took place (Worcester Sum. Ass., 1838) in which it appeared in evidence that the deceased had died from a small punctured wound in the chest. It was five and a half inches deep; it had completely traversed the right ventricle of the heart, and had led to death by loss of blood. The wound was supposed to have been produced by a small skewer, which was found near the spot, but in the defence it was alleged that the deceased had fallen over a tub, and that the wound had been caused by a projecting nail. This allegation, however, was negatived by the surgeon, from the fact of its being a cleanly *cut* wound. Had it been produced in the manner alleged by the prisoners, this would have been indicated by an irregularity of margin, and not only so, but it is hard to believe that a nail would be sticking five and a half inches out of a tub.

In 1853, the careful examination of a wound disproved a charge of maliciously wounding made against innocent persons. A little girl was represented to have received, while sitting over an iron grating, a wound in the pudendum by some person pushing a toasting-fork or pointed instrument between the bars of the grating from below. There were no marks of punctures, which would have been found had this statement been true, but a slight laceration of the parts, such as might have been produced by an accidental fall on the edge of the iron grating while the girl was in a sitting position. There were also marks of bruises on the thigh, such as might have occurred from an accident of this kind. The mother of the child had made a false charge for the sake of exciting public compassion and extorting money. A proper surgical examination of the injury already established that it had resulted from accident. The part of the body in which the injury existed in this case is not usually exposed to laceration or punctures from accident; but the child, for a certain purpose had placed herself voluntarily in this position, and had on her own admission slipped, and thus probably injured herself.

If it be asserted that a punctured wound was produced by a fall on some sharp body such as glass, pot, sharp stone, etc., it is almost impossible for the wound to be of any great depth without a part at least of the material being found broken off in the wound.

When a stab has traversed the body, the entrance aperture is commonly larger than the aperture of exit; and its edges, contrary to what might be supposed, are sometimes everted, owing to the rapid withdrawal of the instrument. That facts of this kind should be available as evidence, it is necessary that the body should be seen soon after the infliction of a wound, and before there has been any interference with it.

3. *Lacerated Wounds* do not in general present greater difficulty with regard to their origin than those which are incised or punctured. The means which produced the laceration are commonly well indicated by the appearance of the wound. These injuries are generally the result of accident; they are, however, frequently met with on the bodies of new-born children, in which case they may give rise to a charge of infanticide. If it could be proved that they had, in these new-born children, arisen from the use of a weapon, this would, of course, go far to a conviction on a charge of murder.

Glass, earthenware, sharp flints, usually produce lacerated wounds with jagged edges, and very uneven; but, on the other hand, it must be remembered that the actual edge of a piece of broken glass is probably sharper than the sharpest of knives. It is therefore exceedingly difficult, if not impossible, to distinguish, by the mere cleanness of the edge of an individual cut, between a cut thus produced and one produced by a knife. It is the little side cuts produced by

fragments of the glass or pottery that will chiefly throw light on the nature of the wounding object, unless it happen (as it will frequently do in cuts of any depth) that fragments of the glass or pot are found in the wound. This is, of course, conclusive evidence.

A case occurred in which a deeply penetrating wound on the genital organs of a woman, which had evidently caused her death, was ascribed by the prisoners charged with the murder to her having fallen on some broken glass; but it was proved that the edges of the wound were bounded everywhere by clean incisions, which rendered this defence inconsistent, if not impossible. A similar defence was made on two other occasions where the cases came to trial. In one, a man struck the prosecutor, and knocked him against a window. On examination there were three deep cuts on the face of the prosecutor, but no weapon had been seen in the hands of the prisoner. He was charged with cutting and stabbing. The surgeon deposed that the wounds appeared to have been inflicted with a knife or razor-blade, and not with broken glass. If the wounds had been made with glass, particles of that substance would probably have been found in them, but there were none. The prisoner was acquitted, the infliction of the wounds by a weapon not being considered to have been sufficiently made out. In another case that occurred in 1841, the prosecutor was knocked down, and his throat was found severely cut, but there was no direct proof that a weapon had been used. In the defence it was urged that the wound had been produced by a broken pane of glass, but the surgeon described it as a clean cut, five inches in length and one inch in depth, laying bare the carotid artery. He considered that it must have been inflicted by a razor or knife, and that it was a cut made by one stroke of the instrument. In *Reg.* v. *Ankers* (Warwick Lent Ass., 1845), a clean cut as from a penknife, about two inches long and one deep, was proved to have existed on the person of the prosecutor, who had fallen during a quarrel with the prisoner. Some broken crockery was lying near the spot, and it was alleged in the defence that a fall upon this had caused the wound. This allegation was inconsistent with the clean and even appearance of the edges of the wound. The prisoner, in whose possession a penknife had been found, was convicted.

In the case of Bryant (Taunton Lent Ass., 1849), which involved a charge of maliciously stabbing the prosecutor, the defence was that many flints were lying about in the road, and, as the assault took place in the dark, the wound might have been inflicted accidentally during a fall. The medical witness could not say that the wounds had been positively caused by a weapon; they might have been produced by the flints. The prisoner was acquitted, as the statute then required proof that a wound had been inflicted by some instrument. A careful examination made at the time of the injury would most probably have enabled the witness to give a decided opinion, instead of leaving the case open to doubt. A puncture made by a flint during a fall is not likely to resemble a stab with a knife. The wound would present some marks of laceration and great irregularity. As the wound was under the ear, it was by no means probable, from the situation, that it could have been thus accidentally caused. A similar question arose in a case in which the prisoner was charged with inflicting a wound with a knife. In the defence it was urged that the wound was caused by the sharp

edge of an oyster-shell. A careful examination made when a wounded person is first seen would enable a medical man to meet suggestions of this kind, which are often thrown out unexpectedly in the defence. The answer to such a question may materially affect the amount of punishment inflicted on the prisoner, as the use of knives or daggers is looked on with severity.

4. *Contused Wounds*[1] present considerable difficulty to the medical jurist. It is not often in his power to say whether a contused wound has resulted from the use of a weapon, from *a blow of the fist*, or *a fall*, by reason of the deceased having accidentally fallen against some hard surface. The question is frequently put to medical witnesses on those trials for manslaughter which arise out of the pugilistic combats of half-drunken men. One of the combatants may be killed either by a blow on the head, by a fall, or by both kinds of violence combined. The skull may or may not be fractured; and the person may die of concussion, inflammation of the brain, or from effusion of blood. The general defence is that the deceased struck his head against some hard substance in falling on the ground, and the surgeon is asked whether the particular appearances might not be explained on the supposition of a fall. A medical witness is rarely in a position to swear with certainty that a contused wound of the head must have been produced by a weapon, and *not* by a fall. Some circumstances, however, may occasionally enable him to form an opinion on this point. If the marks of violence are on the summit of the head, it is highly probable that they have been caused by a weapon, since this is not commonly a part which can receive injury from a fall. So if sand, gravel, grass, or other substances be found in a contused wound, this will render it highly probable that the injury was really caused by a fall. When the question is simply whether a contused wound was produced by a blow of the fist or by a weapon, it may admit of an answer from an examination of the wound, as in the following case. Two men were fighting, and one struck the other a severe blow on the head, felling him to the ground. The deceased was rendered insensible, and soon died. There was a fracture of the skull six inches in length. The prisoner alleged that he struck the deceased only with his fist. The medical opinion was that a blow of the fist could not have produced such a severe injury. Without further details it is impossible to say if this opinion was fairly justified. The fist of a powerful man has frequently caused a fracture of the skull. Much should have depended upon the position and direction of the fracture.

The number of such wounds found on the head, coupled with their position, may be a very strong point totally inconsistent with the defence.

In *Reg.* v. *Howes* (Croydon Sum. Ass., 1853), the deceased, the wife of the prisoner, was found with severe contusions on the head and face, and a lacerated wound on the temple. She died from extravasation of blood on the brain. The defence was that deceased had fallen against a fender while intoxicated, and so had caused the wounds; but it was properly stated by a medical witness that, although a lacerated wound on the side of the head might have been so caused, the other injuries bore the characters of repeated blows. The counsel for the defence wished to make a general amalgamation of all this violence, although the witness had

[1] By a contused wound is here meant a contusion or bruise accompanied with a skin incision.

stated that the head, from the temple to the occiput, was one mass of contusions, independently of the bruises met with on the face. Apart from all scientific speculations, no fall upon a fender could possibly account for the *whole* of these injuries, but it was necessary in addition to assume that the woman was continually drunk (of which there was no proof), and that in falling her head and face alone invariably suffered. In reference to the cause of the violence, Channell, B., remarked: "If there were blows, and by means of blows the prisoner caused the falls, then, though the blows might not themselves be the direct cause of death, he would be responsible for the result." The prisoner was convicted of manslaughter. A similar question arose in *Reg.* v. *Budd* (Kingston Lent Ass., 1868), where a man was charged with killing his wife by blows. It appeared that he had either kicked her, and produced the injury which caused her death, or that she had fallen upon some wood as a result of his violence. Byles, J., said it was not material whether death was caused directly by the blow or kick, or whether the prisoner struck or pushed his wife, and she fell so as to produce the injury which caused her death; the prisoner would equally be guilty of manslaughter. He was convicted. If it could be shown that the fall was the result of some accident, then it might be a good ground for defence.

The chief difficulty in reference to contused wounds arises (as has been above indicated) when the wound in the skin lies over a bone separated from it only by a comparatively thin layer of soft tissue, the typical places being the scalp, cheek bones, the back of the fingers, and a few other similarly situated skin areas. In these situations, wounds produced by blunt objects, such as a cricket-ball, hammer, stone in a stocking, etc., are commonly associated with an apparently clean incised skin wound, and only a close scrutiny of the edges and the surrounding tissues will reveal the fact of a crushed or bruised condition being present. When a wound is recent, a careful examination will generally enable a witness to form a correct opinion, but if some time has elapsed before a wound is examined, great caution will be required in forming a judgment. A man, it was alleged, had been stabbed on the head with a knife. The prisoner struck the blow, and he certainly had a knife in his hand at the time, but whether the wound was or was not produced by the knife could not be determined from the evidence of eye-witnesses. In the defence it was urged that the prisoner had inflicted the wound with his knuckles, and not with a knife. When a surgeon was called to examine the wound some time after its infliction, there was so much contusion and laceration about its edges, that it was impossible to ascertain with the necessary precision by what means it had been caused. There was suspicion, but no medical proof that a weapon had been employed.

A surgeon should be cautious in listening to the statements of others that a weapon has been used unless the wound itself bears about it such characters as to leave the fact indisputable. During a scuffle the person assaulted may be easily deceived as to the way in which an accused party inflicted a wound upon him; and a motive may sometimes exist for imputing to an assailant the use of a weapon during a quarrel. In such cases a medical witness should rather trust to the appearance of the wound for proof of the use of a weapon than to any account given by interested parties. In a case which was tried in 1842 at the Chelmsford Assizes, a surgeon swore that a wound on the nose of the prosecutrix had been produced by a knife, and not by a blow with the fist, as it was alleged in the defence. There seems to have been no good medical reason for the opinion that a knife had

been used; it appears to have been founded chiefly on the loose statement of the prosecutrix herself. Nevertheless a conviction followed upon this evidence, and a respectable woman, charged as accessory, was sentenced to a severe punishment, not for having assaulted the prosecutrix—for it does not appear that she struck a blow—but for aiding another in the supposed act of stabbing. It was alleged that she handed a knife to the assailant, when it was extremely doubtful, medically speaking, whether any knife had been used in the assault. This case conveys a serious caution in respect to the medico-legal examination of wounds. A medical man is not justified in giving a hasty opinion from mere hearsay of a weapon having been employed; he may in this way lead to the infliction of a very severe and unmerited punishment.

There is no doubt that some means of discrimination between the effects of falls and blows affecting the same part of the body would greatly aid the administration of justice; but as no two cases coming under this class of injuries are precisely alike, either in the part wounded or the amount of force employed, it is scarcely possible to introduce general rules or to make statistics practically available. It is commonly supposed that a mere fall is not sufficient to produce the same degree of injury that may be caused by a blunt weapon applied suddenly to the head by human force: but a severe fracture may arise from a simple accident of this kind, and present nearly all the characters of homicidal violence. The difficulties at criminal trials will be found to proceed, not so much from want of rules to assign the violence to one condition or the other, as from a want of proper observation when the wounds are first examined. If minute attention were given to an examination of these injuries soon after their occurrence, circumstances would be noticed which would help the medical witness to a conclusion. The defence that they might have been produced by a fall is not set up until a subsequent period, and the surgeon is then obliged to trust to his memory for the main points of distinction. Such improvised opinions usually fail in impressing a jury.

The case of Mr. Briggs, who was murderously assaulted in a carriage on the North London Railway in 1864, furnishes an illustration of the ease with which homicidal and accidental violence may be distinguished provided attention is directed to this question at the time. There were several wounds on the head of this man which could not have proceeded from one cause. It appeared probable that some had been inflicted on the deceased by an instrument while he was in the carriage; that he had then been thrown from it while the carriage was in rapid motion, and the fall had produced other bruises. The surgeon who examined the deceased found a transverse jagged wound across the left ear, and above this there was a scalp tumour as well as two distinct wounds of the scalp, with effusion of blood beneath, and corresponding fractures in the bones. There had obviously been more than one distinct application of force to produce such injuries. The fractures in the skull in two distinct places indicated the use of a heavy blunt weapon, while the scalp tumour was probably caused by the head coming in contact with the ground at that point. A large stone with some blood and light grey hair, resembling that of deceased, was found in the road near the spot where the body was lying. In this case the assassin, Müller, had no doubt intended that death should appear to be the result of an act of suicide, the fall from a train in motion necessarily producing severe injuries, which might reasonably account for death.

The case of Mr. Gold, who was murdered on the Brighton Railway in 1881 in a similar manner, presented less difficulties, since Mr. Gold

was first shot by his assailant, Lefroy, and then, probably whilst still living, was thrown out of the carriage. An assailant may select his opportunity of inflicting violence upon another while riding on horseback, and by causing him to fall from his horse may thus give the appearance of accidental injuries. A proper medical examination, however, could not fail to reveal the real state of facts.

In 1861, the Baron do Vidil, a French nobleman of high social position, was charged with attempting to murder his son, Alfred de Vidil, under the following circumstances. He invited his son, under false protences, to take a ride on horseback with him; led him into a solitary lane near Twickenham; fell behind, and then suddenly struck his son several severe blows on the head with a heavy riding whip, having a metal head. The young man, although severely wounded, was able to keep his seat, and soon procured assistance. The Baron alleged in defence that his son's horse had shied and had thrown him against a wall. The surgeon who examined the son soon after the occurrence found on the head two star-shaped contused wounds cutting through the skin to the bone, one at the upper part of the forehead, near the hair, and the other at the back of the head. There were no scratches or other injuries to the face. The medical witness very properly said that these two wounds in different parts of the head were inconsistent with their production by any fall or by such an accident as that assigned by the accused. They had the appearance of having been caused by separate blows from some heavy blunt instrument, the force being concentrated on each point. This medical view of the cause of the injuries was borne out by the direct evidence of an eye-witness who saw the prisoner strike the blows. It was proved that by the death of his son the prisoner would have come into the possession of a large sum of money. The Baron was tried and convicted of an assault upon the medical and general evidence, although the son refused to be a witness against him.

When it is a question which of two weapons produced certain contused wounds found on the head, the difficulties of medical evidence are increased. In *Reg.* v. *Teague* (Cornwall Sum. Ass., 1851) the prisoner was charged with the murder of his father-in-law. The deceased was found dead with a large wound in the centre of the forehead. According to the medical evidence, it had the appearance externally of being two, but was in reality only one wound, inflicted by more blows than one. The wound was nearly of a circular figure, with a band of skin passing vertically across it. The bone had been driven in to some depth. A large hammer was found near with white hair upon it, but no blood. It was alleged for the prosecution that the contused wound had been produced by this hammer by the act of the accused, and it was stated by the medical witness that one end of the hammer corresponded to the shape and other physical characters of the wound. The defence was that the injury had been caused either by a fall, or by a kick from a horse. It was not at all probable that any fall could have produced such a wound without greatly disfiguring the face, which presented no marks of injury; and in reference to its production by a kick the witness compared the horse's shoes and found that the wound bore no resemblance whatever to them. One circumstance appeared to connect the hammer with the wound, namely, the presence of some white hairs upon it; but the evidence failed to fix the crime upon the prisoner, since it only went to prove that he had had the opportunity of committing the crime, but there was no apparent motive for its commission (*Med. Gaz.*, 1851, vol. 48, 729).

In most instances an accurate observation of the form of a contused wound, and an early comparison of it with the supposed weapon or the

substance said to have produced it, will enable a witness to come to a correct conclusion on the subject. The situation, depth, and shape of the wound may be such that no accidental fall could reasonably account for its production. In *Reg.* v. *Skelton* (Carlisle Spring Ass., 1858) the evidence showed that deceased, an old man, had died from violence to the head. He was found insensible and bleeding in the road, not far from the prisoner's house. An angular stone was lying near to his head. There were no bruises on the body, but on the left side of the crown of the head there was a square-shaped hole about the size of a half-crown, the bone being there driven in. Three inches below this, above the tip of the ear, there was another fracture of the skull under a narrow scalp-wound about an inch in length. In the prisoner's house was found a hammer, which had a square face, with the corners rounded off; and on comparing this with the indented wound and fracture it corresponded very nearly in shape and width. The other end, when compared with the smaller wound near the ear, also corresponded. The hammer, as it frequently happens with heavy bruising instruments, had no blood upon it, nor anything to indicate that it had been used for inflicting the injuries. The stone found near the deceased had upon it blood and mud at one corner, and a white human hair adhered to it. It was admitted by the medical witnesses that, had the deceased fallen heavily upon this stone, it would have accounted for the lesser wound; and, with respect to the indented wound, it was suggested that, had he been knocked down by a horse and trampled on, the "caulker," or square piece of iron at the heel of a horseshoe, might have produced it. They at the same time stated that the other part of the shoe would have left some mark, of which there was no trace. The hat worn by the deceased at the time presented no indentation or mark. It is probable from this description that the injury was produced by a weapon, but the evidence failed to connect the prisoner with the act.

In assaults on women, it is not unusual to find that the complainant herself endeavours to exculpate the assailant by ascribing the marks of violence, not to blows, but to some accidental fall. In 1864, a woman deposed before a magistrate that certain severe injuries which she had sustained had been caused by her falling on a fender. The medical man who examined her found on the top of the head three distinct wounds which were bleeding. Two appeared as if they had been caused by a blunt instrument; the third, on the back of the head, was a cleanly cut wound. He considered that they had been produced by a chopper, and that none of them had been caused by a fall or a series of falls.

5. *Bruises without Skin Incision.*—A good deal has to be said with reference to "How was this Bruise or this Effusion of Blood caused?" on the following grounds:—

(*a*) It occasionally happens that the shape of a bruise corresponds somewhat closely with the shape of the bruising violence or implement.

(*b*) More frequently in bruises beneath the skin (superficial) the bruise has no relation whatever either to the shape of the object producing it or to the amount of violence employed.

(*c*) There may be a deep effusion of blood without any visible (from without) bruise whatever.

(*a*) *Bruise corresponding to Shape of Object.*—In hanging, the impression caused by the cord on the neck is sometimes ecchymosed, and indicates its course with precision; so also in strangulation, when the fingers have been violently applied to the fore part of the neck, the indentations produced may serve to point out the manner in which life was destroyed. A case is mentioned by Starkie which shows that the form of an ecchymosis may occasionally furnish presumptive evidence against an accused party. In an attempt at murder, the prosecutor, in his own defence, struck the assailant violently in the face with the key of the house-door, this being the only weapon he had near at hand. The ecchymosis which followed this contusion corresponded in the impression produced on the face to the wards of the key; and it was chiefly through this very singular and unexpected source of evidence that the assailant was afterwards identified and brought to trial ("Law of Evidence," vol. 1, article "Cir. Ev.").

Similarly in cases of alleged rape with struggling on the part of the victim small bruises corresponding to finger-marks may be found about the arms.

(*b*) *Bruises not corresponding to the Violence.*—The one important point to insist upon here is that such want of correspondence is really the commonest event, correspondence being unusual. The reasons for non-correspondence are several:—

(i.) Hæmorrhages small or large beneath the skin are very common as a result of disease without any violence having been inflicted. In aged persons it is not unusual to find the legs and feet covered with livid patches, sometimes of considerable uniformity of colour, and at others much mottled. These discolorations, which after death or during life might be mistaken for ecchymosis from violence, arise from the languor of the capillary circulation in such persons. The blood finds its way with difficulty through the venous capillaries, and the marks are commonly observed on the lower parts of the body, because they are far removed from the centre of circulation, and the blood has to rise in opposition to gravity.

In January, 1904, in a lunatic, the editor was asked to examine such a mark, and was able to assure the friends that no violence had been inflicted upon the patient.

The disease known as erythema nodosum produces a condition on the shins in young girls indistinguishable from bruises except by the history. The patches show discoloration exactly like a bruise, and if alleged to be done by violence (for blackmailing or other purposes) their usual symmetry on both legs and the absence of skin abrasions over them would be the only means of distinction.

Purpura, scurvy, hæmophilia, drug rashes, the malignant cases of infectious disease, are all illustrations of diseases in which subcutaneous spontaneous bleeding may take place. In general there is no difficulty in distinguishing such cases during life, at any rate. The multiplicity of the spots, the very great diversity in the sizes of them, their symmetry, and especially (as above noted) the absence of any abrasion over the spot will serve as distinguishing features from the bruises of violence without entering into the full clinical features inappropriate to the present work.

(ii.) In women, in persons who are flabby, out of health, or actually suffering from one of the above diseases, it is well known that a very small amount of violence will produce a very large bruise. It is uncertain from a medical point whether this be due to brittleness of the vessels or to conditions of the blood, and need not be here discussed; but the fact is too well established to need even illustrative cases. In similar persons even the act of violent vomiting or other muscular exertion may cause an effusion of blood.

(iii.) When a bruising violence is applied to the body it may happen that the vessel which gives way and so causes the bruise (effusion) lies below a fascia or deep amongst the muscles. In such a case the effused blood passes in the direction of least mechanical resistance, and may, therefore, appear at a considerable distance from the seat of violence, and will take a shape entirely dependent upon these resistances amongst the tissues. It is a very common circumstance for a bruise thus to appear at some distance from a fracture of the leg. For instance, Syme met with a case in which a compound fracture of the tibia was produced by a carriage wheel. There was no bruise round the wound in the skin, but after some days the skin by the knee and thigh became discoloured. This event needs no further illustrations; it is of well-known common occurrence.

(*c*) *There may be Severe* (*Fatal*) *Effusion and no External Bruise or Abrasion.*—It has been repeatedly asserted in courts of law that no severe blow could have been inflicted on the body of a person found dead in consequence of the absence of ecchymosis or other indication of violence from the part struck; but this assertion is opposed to well-ascertained facts. However true the statement may be that severe contusions are commonly followed by ecchymosis, it is open to numerous exceptions; and unless these are known to a practitioner, his evidence may mislead the court. The presence of ecchymosis is commonly presumptive evidence of the infliction of violence, but its absence does not negative this presumption.

So commonly has the editor, at the London Hospital, found severe lacerations of internal organs with fatal effusion of blood (in accidental cases: cart-wheels, falls, etc.) without any external bruising of the skin of the trunk that he was led to believe that it is the rule rather than the exception for such to be the case. The most remarkable case of the kind occurred in 1896 as follows: A boy æt. 8 was brought into the hospital dead. It was reported that he had been knocked down by a heavy cart and was supposed to have been run over. There was not the slightest trace of abrasion or bruising of the skin of the chest nor behind the ribs and sternum, but the upper lobe of the right lung had been cut completely off from the root of the lung and was floating freely in a pleura full of blood. The cause of death was obvious; the entire absence of bruising was extraordinary. He has seen the liver and spleen very badly lacerated, and even the psoas muscle torn similarly without external bruising.

In some of the cases the part ruptured has been the intestines or the urinary bladder, from which a large quantity of blood would not flow. A case is reported by Henke in which a labouring man died some hours after fighting with another, and on an inspection of the body the peritoneum was found extensively inflamed, owing to an

escape of the contents of the small intestines, which had been ruptured to a considerable extent. There was, however, no ecchymosis or mark on the skin externally, and the medical inspectors were inclined to affirm, contrary to direct evidence, that no blow could have been struck; but others of greater experience were appealed to, who at once admitted that the laceration of the intestines might have been caused by a blow, even although there was no appearance of a bruise externally. Watson states that a girl, aged nine, received a smart blow upon the abdomen from a stone. She immediately complained of great pain, collapse ensued, and she died in twenty-one hours. On inspection there was no mark of injury externally, but the ilium (one of the small intestines) was found ruptured, its contents extravasated, and the peritoneum extensively inflamed ("On Homicide," p. 187). A man received a kick on the abdomen from a horse; he died in thirty hours from peritonitis. The ilium was found to have been torn completely across in its lower third. There was not the slightest trace of ecchymosis externally, a fact which is the more remarkable since the blow was here struck by a somewhat angular or pointed body—the hoof of a horse (*Med. Gaz.*, vol. 26, p. 349). In a fatal railway accident which occurred at Leicester in 1854, there were no marks of external violence on the head, but Macaulay found a laceration of the left hemisphere of the brain, with effusion of a large quantity of blood which had coagulated.

Many cases might be adduced in support of the statement that ecchymosis is not a necessary or constant result of a severe blow or mechanical violence; but those above related sufficiently establish the fact (see "Ruptures of the Heart, Liver, Spleen, and Kidneys," *post*). This medico-legal question frequently arises in cases in which the bladder or liver is ruptured, as, owing to the general absence of marks of violence, it is often alleged in defence that no blow or kick could have been inflicted on this part of the abdomen. The incorrectness of this view will be apparent by a reference to cases of ruptured bladder related in another part of this work.

The explanation of the abdominal cases is not really very difficult. In the first place, the clothes prevent actual contact of a limited hard body (such as a horse's hoof) with the skin. This in itself tends to spread the blow, and so diminish its local concentrated effect. Again, the abdominal parietes if taken unawares, as they are in such cases, are soft and yielding to a broad blunt surface, while the liver, spleen, and kidneys and a *full* bladder are comparatively firm and unyielding, and so suffer laceration. It is not quite so easy to see how an intestine or empty bladder get thus ruptured, but presumably they must get pinched between the applied force and the bodies of the vertebræ. Such was the editor's opinion on the case of lung quoted above, though there was no positive evidence (bruising of the bone) to support such a view.

As regards the brain, laceration by contre-coup or shaking (like a shaken jelly) is well recognised as a cause of hæmorrhage into the organ. (*Vide* Rawlings in *Lancet* for April 23rd, 1904.)

6. *Fractures of Bones: Fragilitas Ossium.*—Into the pathology of this condition it would be out of place to enter here; it must suffice to state that such a condition, acquired or congenital, does exist, a condition in which the bones break with very unusual ease, so that

only a slight amount of violence is required to break them. As a matter of clinical experience, the condition is commoner amongst our insane population. For a full discussion of the nature and frequency of this fragilitas ossium in the insane *vide* a paper by Dr. W. M. Smith, of the West Riding Asylum, in the *B. M. J.*, 2, 1903, p. 824. He there analyses two hundred deaths of insane people. A full discussion by other alienists followed the reading of the paper. It is also more common amongst elderly people than in younger subjects. On September 21st, 1903, the editor performed an autopsy on the body of E. P., female, æt. 65, cause of death septic pneumonia, no other peculiar features about the case except that she had a fracture of the neck of the thigh bone produced by rolling over in bed in a semi-helpless condition, and that her ribs could be broken by the finger with as great ease as one could break a piece of cardboard of the same thickness; this one case is very typical, and will serve as well as a hundred such to show that the condition exists.

Its importance lies, from a medico-legal point of view, in that when an attendant in an asylum is charged with gross cruelty to a patient, possibly involving a charge of manslaughter, it is assumed that great violence must have been used if several bones (ribs usually) are found to have been broken. The defence made is that no more violence was used than was absolutely necessary, and that the bones broke unusually easily. If the victim be living, such a defence is certainly justifiable, and cannot be disproved by medical evidence alone, but must be refuted, if at all, by general evidence; if the victim be dead, the condition of fragilitas ossium can certainly be proved beyond controversy either to be present or not, and the medical evidence given accordingly with no uncertain voice.

Another diseased condition of the same class, but probably owning a different pathology, is mollities ossium, met with almost exclusively in pregnant women. In the case of this being brought forward in defence of a prisoner charged with severe violence to a woman, the same remarks may be made as in the analogous condition above.

B. **Evidence from Examination of Dress.**—This is a most important part of the duty of a medical man. In a case of severe wounding, of whatever kind, he should always require to see the dress of a wounded person. It may throw a material light upon the *mode* in which a wound has been produced; it may remove an erroneous suspicion of murder, and may sometimes serve to indicate that a wound has been self-inflicted for the concealment of other crimes, or falsely to impute its infliction to other persons. Marks of blood, dirt, grass, or other substances on the clothing, may also throw a light upon the mode of infliction. So, again, the use of a weapon, in reference to cuts and stabs, may be inferred from the dress presenting corresponding cuts or perforations. Contused wounds by bludgeons may, however, be readily produced through the dress, without tearing or injuring it. Considerable laceration of the skin and muscles, and even severe fractures, may be caused without necessarily penetrating the dress, supposing it to be at all of an elastic or yielding nature. In self-inflicted or imputed wounds, if of the nature of cuts or stabs, there is often a want of correspondence between the perforations of the dress and the wounds on the person; this is one of the characters

by which the correctness of a statement may be tested (see "Imputed Wounds"). A severe wound may be indirectly produced by a bruising weapon, and medical witnesses have been often questioned on this point. Thus the prosecutor may at the time have worn about his person some article of dress which received the blow, and this may have caused the wound. On a trial for maliciously wounding (Reading Spring Ass., 1837) it appeared in evidence that the prisoner while poaching assaulted a gamekeeper by inflicting on his head severe blows with a gun. At the time of the assault, the prosecutor wore a strong felt hat, which, it was contended in defence, had caused the wounds that formed the subject of the charge. The medical witness admitted that the wounds might have been produced either by the gun, or by the hat through a blow from the gun. The prisoner was convicted; this was held to be a wounding, although the gun did not touch the skin. In another case, a blow was struck with a bludgeon at the head of the prosecutor, who wore spectacles. Wounds were produced which, it was urged in the defence, had resulted from the glass of the spectacles, and not from the bludgeon. The prisoner was acquitted. Every case of this kind must be determined by the circumstances which accompany it. One fact appears to be well established from the foregoing cases—namely, that a medical practitioner should always make a careful examination not only of wounds which are likely to become the subject of criminal charges, but of the dress or clothing worn by the wounded person at the time of the assault. In performing his duties as a surgeon, he is bound, so far as he consistently can, to notice as a medical jurist the characters of all personal injuries, so as to be able to give an opinion on the mode in which they were inflicted.

When the question is simply whether the contused wound resulted from accident or homicide, a careful examination of the dress may tend to remove any medical or legal doubts. A man was found dead in a stable, not far from a vicious mare, and the traces (harness) of this animal were upon his arms and shoulders when the body was discovered. The brother of the deceased was tried (Warwick Spring Ass., 1808) on the charge of having killed him with a spade, which was found lying in the stable. This spade was stained with blood, but the evidence from this fact was wholly set aside by the circumstance that the spade had been subsequently used in cleaning out the stable. In the defence it was alleged that the deceased had been kicked by the mare while attempting to put on the traces, and had thus been accidentally killed. There were two straight *incised* wounds, apparently caused by a blunt instrument, on the left side of the head, one about five and the other about two inches long. On the right side of the head there were three irregular wounds of a mixed lacerated and incised character, two of them about four inches in length. There was also a wound on the back part of the head, about two and a half inches long. There was no swelling round any of the wounds, and the skin adhered firmly to the bone. The right side of the skull was generally fractured, the fracture extending along the back of the head to the left side, a small portion of the temporal bone having come away. The deceased was found with his hat on, which was bruised in the part corresponding to the seat of injury, but not cut; but there were no wounds on any other part of the body. Two medical witnesses expressed a strong opinion

that the injuries could not have been produced by kicks from a horse, grounding that opinion principally on the distinctness of the wounds, the absence of marks of contusion, the firm adhesion of the skin, and the straight lateral direction and similarity of the wounds. They also thought that they could not have been inflicted without cutting the hat, if this had been on the deceased's head at the time; and if the hat had been off, that he could not have had the power to put it on after receiving the wounds. The case was not made out against the prisoner, and he was acquitted (Wills's "Circ. Evidence," p. 302). Taking the facts as they are here reported, there seems to have been no good medical reason for assuming that the wounds on the head were homicidally inflicted. The fact that they had a somewhat incised character is not a positive proof that the spade was used in producing them, since an instance has occurred where the skin of the scalp presented a similar incised appearance from the kick of a horse; and this is not an unusual consequence of a severe and sudden blow on those parts of the body where the elastic skin is stretched over rounded surfaces of bone. In this case, however, another question arose, namely, whether wounds of this description could be inflicted on the head without necessarily cutting through the hat. Admitting it to be improbable that the deceased could have placed the hat on his head after being thus wounded, we must infer that it was on his head at the time, and assuming that the injury was produced by the bruising violence of a horse's hoof, it is easy to understand that the scalp might be wounded and the skin broken without causing more than an indentation in the hat. Had the spade been used, it is less probable that the hat would have escaped the effects of violence. Hence the witnesses who assumed that the deceased had been killed by the spade were obliged to suppose that the hat must have been off, and put on afterwards; therefore that there must have been murderous interference. This, however, would not explain the fact that the hat was not indented over the situation of the principal injury. On the whole, this seems to have been really a case of accidental violence, this theory being strongly supported by the condition in which the hat was found on the head of deceased. It is of some importance as a medico-legal fact that the skin may be readily wounded through the dress without the latter being necessarily cut or torn. Wood, B., who tried the above case, stated at the time that he remembered a trial at the Old Bailey where it had been proved that a cut and a fracture had been received without having cut the hat of the wounded person, and evidence was then adduced of the infliction of a similar wound without cutting the hat.

An instructive case which occurred in August, 1853, shows the importance of comparing the article of dress with the injuries which may have proved fatal. A woman, æt. 60, was found dead in her bed. She had vomited slightly, and on the floor there was a small quantity of blood which had flowed from her nose. She had been seen in her usual health on the previous night. On inspection there were found two indentations about the middle of the right parietal bone, and there was a large clot of blood in this situation beneath the skin. On removing this clot, the bone was found fractured to the extent of four inches. Nearly three ounces of dark clotted blood were found on the outer membrane of the brain (dura mater), between it and the skull. All the

other viscera were healthy. This was the only injury, and quite sufficient to account for death; but a question arose respecting the mode in which this fracture was caused. It was in evidence that on the evening before her death the deceased had been suddenly knocked down, while she was walking in a public road, by a man accidentally running against her. One witness stated that she fell heavily on the back of her head, on which at the time she wore a bonnet. She appeared stunned, was raised up by the man, some brandy was given to her, and she recovered sufficiently to walk home and eat her supper as usual, after which no one saw her until she was found dead in bed on the following morning. Some suspicion arose that the violence done to the head was too great to be accounted for by a mere fall, and it was a question whether, with such an amount of injury, the deceased could have walked to her home, at the distance of a mile and a half, and have eaten her supper before going to bed. At first it was thought that this was a case of murder, and a man who lodged in the house with deceased was suspected. His room was searched, and a hammer with two claws was found. On comparing these claws with the two indentations and fracture the medical witness thought that this weapon would at once account for their production. The deceased and this man had been in the habit of quarrelling, and they were the only persons in the house on this occasion. The lodger said that he let the woman in about nine o'clock (the fall in the road occurred about 7.30 p.m.); her appearance presented nothing unusual, and he saw no more of her until called at seven the next morning, when she was found dead and cold. It was only at the adjourned inquest that the bonnet worn by the deceased at the time of the fall was called for by the coroner. Two indentations were then found upon the back part of it, corresponding to those on the skull of deceased. The indentations on the bonnet contained dust and dirt, thereby confirming the statements of the witnesses, and rendering it probable that the fall in the road had caused the fatal injury to the head.

The examination of the dress, in this case, cleared up what might have been otherwise doubtful. It is probable that the large internal effusion of blood which caused death did not take place until deceased had reached home, and perhaps as a result of the exertion made. She must have died very soon after she went to bed, as her body was found cold at seven o'clock the next morning. In addition to the caution which this case conveys respecting medical opinions on the origin of wounds, it shows that persons may walk and die at a considerable distance from the spot where serious injury to the head has been sustained.

The examination of the clothing in the Waterloo Bridge tragedy threw some light upon the question of murder. An overcoat presented, in the collar behind and towards the left side, a cut or stab as from a double-edged knife. The undercoat as well as the waistcoat presented the mark of a similar stab corresponding in size, form, and direction to the cut in the collar of the overcoat. The shirt beneath was much stained with blood. The stab took a direction from above, downwards, and must have penetrated into the chest. Its situation and direction precluded the idea of its having been self-inflicted. As there was no blood on the overcoat where cut, the weapon had not before been used

for inflicting a wound, and the deceased had obviously been stabbed from behind with all his clothes upon him. The theory that this was not a murder would involve the assumption that the overcoat, undercoat, and waistcoat had been placed upon some lay-figure for the purpose of imitating a fatal stab behind, and that the undershirt had been covered with blood to add to the appearance. No reasonable motive could be assigned for such a proceeding.

In reference to clothing, it is advisable, if it be possible, to have some clear proof that the clothes sent for examination were actually worn by the accused, or that they had belonged to the deceased and were really taken from the body. Serious mistakes are sometimes made, and opinions should therefore be expressed with caution. In the case of Hatto (Bucks Lent. Ass., 1854), the clothes said to have been worn by the prisoner on the night of the murder were examined. On the shirt there were no marks of blood; on the trousers and cap there were a few stains of blood: but it was admitted that, from the appearance of these, they might have been on the clothes five or six weeks, and therefore several weeks prior to the date of the murder. Owing to this want of certainty respecting date, these clothes were not produced in evidence ; and it subsequently turned out by the confession of the prisoner, and the discovery of other articles of dress in places where he admitted he had concealed them, that the clothes which had been examined were not worn by him when he perpetrated the murder. In the case of Munro (Cumberland Spring Ass., 1855), the clothes supposed to have been worn by the prisoner were sent for examination. There was no blood on the trousers, and it appeared, from the evidence at the trial, that the prisoner had changed this article of dress before he was apprehended. In a case of suspected murder, we should examine for blood, not only articles of dress produced by the police, but any others that might have been worn by the accused at the time of the occurrence. In the Road murder, *Reg.* v. *Constance Kent* (Wilts Sum. Ass., 1865), the omission to inquire minutely in the first instance into all the articles of dress led to the defeat of justice. The prisoner, a girl only sixteen years of age, showed an amount of cunning, in the perpetration and concealment of this murder, rarely met with among old and experienced criminals. From the nature of the wounds on the body of the infant, her stepbrother, it was not probable that the dress of the person inflicting them could have escaped being stained. It appears that she had *three* night-dresses, but only two were produced. When asked for an explanation, she said one had been lost at the wash a week after the murder. This was proved to be a falsehood by the laundress and her daughter. From other facts proved in the case, there was no doubt that the prisoner had soon after the murder secreted one of her night-dresses stained with blood ; she then put out a clean one for the wash to avoid suspicion, but afterwards clandestinely took this back again to her bedroom. This gave some ground to her statement that the missing one of the three had been lost at the wash. Within twenty-four hours of the murder a chemise wrapped in brown paper and stained with blood was found by a policeman in a fire-hole in the scullery ; this was most probably the missing night-dress. She stated in her confession that she burnt the dress worn on the night of the murder five or six days afterwards. The three night-dresses should

have been produced or accounted for at once; and had this been strictly carried out, a heavy load of suspicion would have been removed from several innocent persons, and a crime like this would not have remained concealed for five years.

A medical man should observe on these occasions whether the blood is deposited in large patches on clothing, or whether it is sprinkled, and also make a note of the quantity. The sprinkling may have proceeded from a wounded artery, or from a splashing of blood as a result of continued violence. We should likewise notice whether, if the wound is in the throat or chest, blood has flowed down in front of the clothes or person, or whether it has flowed so as to collect in the armpits, on each side of the neck, or under the back; for these appearances will sometimes show whether the wound was inflicted when the person was standing, sitting, or lying down. If the throat is cut while a person is lying down, it is obvious that the blood will be found chiefly on either side of the neck, and not extending down the front of the body. Few suicides cut the throat while in a recumbent posture, and the course which the blood has taken may, therefore, sometimes serve to distinguish a homicidal from a suicidal wound.

The nature of the dried spots of *mud* on clothing may occasionally serve to connect an accused person with an act of murder. In the case of *Reg.* v. *Snipe and others* (York Wint. Ass., 1852), evidence was adduced to show that some spots of mud on the boots and clothes of the prisoner, when examined microscopically, presented infusorial shells, and some rare aquatic vegetables, particles of soap, confervæ, and hairs from the seeds of groundsel. The mud of a ditch close to which the body of the deceased was found presented the same microscopic appearances as the mud from the prisoner's boots; and the witness who gave this evidence deposed that in his opinion the mud-spots were derived from this ditch. He had examined the mud of all the other ditches in the locality, and found it to be different. Admitting the opinion to have been correct, this circumstance clearly connected the prisoner with the act; and it was borne out by the fact that he had been seen near the spot on the night of the murder. In a case which occurred in November, 1857, the author found granules of wheat-starch mixed with the blood-stains on the gaiters of a man charged with murder. He had been just before the occurrence engaged in sowing seed-corn. So in *Reg.* v. *Steed* (Maidstone Sum. Ass., 1863) on the soles of the boots belonging to the prisoner portions of farinaceous matter were discovered adhering to the nails, in addition to blood, hair, and woollen fibres. It was proved in evidence that after the murder the prisoner had gone into a country baker and flour-dealer's shop, and trodden on the floor, on which there was flour. The above facts tended to corroborate the evidence that the prisoner was the man who had been seen in the shop.

WAS THIS WOUND INFLICTED DURING LIFE OR AFTER DEATH?

The means we have for determining this important question are all connected with the reaction of *living* tissues to irritants and injuries. If a wound has been inflicted before somatic or even before local (*vide*

"Signs of Death") death of the tissues in which it occurs, some or all of the following signs will be observed:—

1. Hæmorrhage, in free wounds and in bruises.
2. Retraction of edges of wound.
3. Signs of inflammation.
4. Signs of repair.

1. **Hæmorrhage.**—In another part of this work (Sect. V.) a full discussion will be found on the cessation of the circulation as a sign of death, also on post-mortem venous bleeding (Sect. V.). Again, in Sect. IV., in testing for blood will be found the minuter differences between living and dead blood (fibrin, evidence of spirting, etc.). We are here concerned more with the *quantity* of the effused blood.

When an incised wound is the cause of death, the person dies either immediately, in which case there is copious bleeding from the wounded organ or some large vessel, or he dies after some time, in which case, as the wound continues to bleed during the time that he survives, the longer he lives the more copious will be the effusion of blood. In a wound inflicted after death, and while the body is still warm, nothing of this kind is observed. Unless the weapon injure one of the large veins, the bleeding is generally slight, so that the *quantity of blood* lost may assist us in determining whether the wound was made during life or after death. When the body has been moved, and all marks of blood effaced by washing, rules of this kind cannot serve a medical witness, and the time at which the wound was actually inflicted must then be deduced from other circumstances. In the case of Greenacre, who was convicted in 1837 of the murder and mutilation of a female, this formed a material part of the medical evidence. The head of the deceased had been severed from the body; and the question was whether this severance had taken place during life or after death. The prisoner alleged in his defence that it was after death; but the medical evidence went to establish that the head must have been cut off while the woman was living, but probably after she had been rendered insensible by a blow on that part, the marks of which were plainly visible. This medical opinion was founded on two circumstances. The muscles of the neck were retracted, and the head was completely drained of blood, showing that a copious and abundant flow must have ensued at the time of separation, and therefore indicating that the circulation was probably going on at that time. On cutting off a head after death a small quantity of blood may escape from the jugular veins, but this soon ceases, and the quantity lost is insufficient to affect materially the contents of the vessels of the head. The chief medical witness, Girdwood, expressed himself with proper caution by stating, in answer to a question from the judge, that the wounds in the neck had been inflicted either during life or very shortly after death, while the body still preserved its warmth. The circumstantial evidence tended to show that the deceased was first stunned, and that her head was cut off while she was in a state of stupor. If the wound be not made until twelve or fourteen hours have elapsed from the time of death, it cannot be mistaken for one produced during life. Either no blood is effused, or it is of a venous character; *i.e.*, it may have proceeded from some divided vein. The blood is in small quantity, commonly liquid, and it does

not coagulate as it falls on surrounding bodies, like that poured out of a wound in the living.

A post-mortem *lacerated* wound occurring as the result of accident may be attended with such an effusion of blood as to deceive a medical man, unless all the facts of the case are known. In another part of this work ("Post-mortem Bleeding") is described a case communicated by Gibson, formerly the surgeon of Newgate Prison, in which, except from the proof of accident after death, a surgeon might have come to the conclusion that the deceased had been maltreated during life. In any case in which it is doubtful whether a wound was inflicted on a living or dead body, it will be proper to adopt the same cautious mode of expressing a medical opinion, since it must be remembered there are no decisive characters by which wounds of the kind referred to can be distinguished; and a medical witness is as likely to be wrong as right in selecting either hypothesis. It is a considerable step in evidence when we are able to assert that a particular wound, found on a dead body, must have been inflicted either during life or *immediately* after death; for it can scarcely be supposed that in a case calling for criminal investigation any one but a murderer would think of inflicting upon a body immediately after death a wound which would assuredly have produced fatal effects had the same person received it while living. So soon as such an opinion can be safely expressed by a witness circumstantial evidence will often make up for that which may be, medically speaking, a matter of uncertainty.

The copious effusion of blood has been set down as a well-marked character of a severe wound received during life; but this observation applies chiefly to cuts and stabs. Lacerated and contused wounds of a severe kind are not always accompanied by much bleeding, even when a large bloodvessel is implicated. It is well known that a whole member has been torn from the body, and that little blood has been lost; but in such cases coagula or clots of blood are commonly found adhering to the separated parts, a character which indicates that the wound was inflicted either during life or soon after death, while the blood was still warm and fluid. When a lacerated or contused wound involves a highly vascular part, it is liable to cause death by loss of blood, although no large bloodvessels may be implicated. A prisoner was charged (*Reg.* v. *Crawley*, Liverpool Wint. Ass., 1847) with having caused the death of his wife by kicking her in the lower part of the abdomen. Copious bleeding followed; and, in spite of medical assistance, the woman died very shortly afterwards, evidently from exhaustion produced by the loss of blood. It was stated in evidence that there was no external laceration, but an examination of the body showed that a contused wound of the genitals had been produced *internally*, and had given rise to fatal bleeding. There is nothing at all remarkable in such a result, considering the abundance of small bloodvessels in these parts of a woman. If from any cause we cannot estimate the quantity of blood lost, then the presence of small clots entangled in the tissues at the edges of the wound constitutes good evidence of "inflicted during life."

Bruises without Broken Skin: ante v. *post-mortem.*—It must be remembered that in a bruise without broken skin the blood has to escape under a certain amount of resistance. The force that overcomes this

resistance is supplied by two factors: (1) the beat of the heart; (2) the elastic force of the arteries or veins. At the moment of death the first of these factors sinks at once to zero, and in the *veins* the second factor is always very small; the second factor, in the *arteries* too, sinks very rapidly, and probably in, at the outside, half an hour becomes *nil*. It follows from this that the *amount* of blood effused in a bruise becomes at once the most important point in determining whether the violence was inflicted before or after death.

If a bruise has been caused some hours before death, there will be swelling of the part, and probably also certain changes of colour in the bruised patch, in either of which cases there will be no difficulty in forming an opinion. Although bruising, or an appearance analogous to it, may be produced on a body after death, the changes in colour are then met with only under peculiar circumstances, to be presently mentioned. If the blood found beneath a bruised spot is clotted, this will afford a presumption of its having been effused during life, although, strictly speaking, it only proves that the effusion must have taken place either before death or very soon after it. The experiments related, in speaking of incised wounds, show that blood effused from a wound ten minutes after death may be found in a coagulated state. Again, the circumstance of the blood effused under a contused wound being *liquid* is not a proof that the effusion took place after death if the autopsy be performed very soon after death, or if there be long delay, when it may have become again fluid from decomposition. Blood effused into the spinal canal during life is often fluid, and it is well known that blood may be found coagulated in some parts of the body, while it remains fluid in others. Blood coagulates more slowly in the dead body than in a vessel into which it has been drawn during life or after death. The blood may remain fluid in a dead body from four to eight, and, according to Donné, as long as twelve hours after death ("Cours de Microscopie," 52). It rarely begins to coagulate until after the lapse of four hours; but if drawn from a bloodvessel and exposed to air, it would coagulate in a few minutes after its removal.

In general, bruises which have been produced during life, and in which the effused blood remains liquid, may be recognised by the *extent* of the effusion. If under the bruised parts we find a large quantity of liquid blood, and the seat of injury is so situated that the blood could not have become infiltrated into it from elsewhere, we may confidently pronounce that the effusion must have preceded death. In a dead body a bruising blow would cause but little extravasation. The sign which is most satisfactory as a criterion, in the opinion of Christison, is, however, the following:—In a bruise inflicted during life, the ecchymosed portion of cutis (true skin) is generally dark and much discoloured by the infiltration of blood throughout its whole thickness; the skin at the same time is increased in firmness and tenacity. This is not, however, a uniform consequence of a bruise during life; for a blow may cause effusion of blood beneath the skin without affecting the cutis in the manner stated. The state of the skin here described cannot be produced by a bruising force on a dead body, although it is still an open question whether it might not be produced if the contusion were inflicted a few minutes after death. As it is, the value of this sign is somewhat circumscribed. It is not always produced on the

living; it might be possibly produced on the recently dead; so that when it does not exist we must look for other differential marks, and when it does exist we ought to satisfy ourselves that the bruise was not inflicted soon after death.

The period at which such injuries cease to resemble each other has not been fixed with any degree of precision; but, as in the case of incised wounds, it would seem that there is little danger of confounding them when a contusion has not been inflicted on a *dead* body until after the disappearance of animal heat and the commencement of cadaveric rigidity. Christison found that sometimes the appearance of contusion could hardly be produced on a dead body two hours after death; on other occasions such an appearance might be slightly caused after three hours and a quarter, but this period was near the extreme limit. Whenever the warmth of the body and the laxity of the muscles are not considerable at the time the blow is inflicted, the appearance of contusions during life cannot be distinctly produced. It is, therefore, only on the trunk that even in the most favourable state of the body—namely, when warmth is retained and the blood remains altogether liquid—a mark resembling a contusion on the living body can be produced so late as *two hours* after death (*Edin. Med. and Surg. Jour.*, No. 99, p. 247 *et seq.*). Notwithstanding these satisfactory results, it will be seen that, from the moment of death until after a lapse of two hours, contusions may be followed by appearances on the dead almost identical with those observed on the living. The *earliest period* after death in which an experiment was tried on the human body was *one hour and three quarters;* in this case the similarity was so strong that we may infer if the experiments had been performed within half an hour, or even an hour after death, it would have been difficult to say whether the blow producing the discoloration had been inflicted on a living or dead body. Christison's experiments lead to the conclusion that *severe* blows inflicted on a recently dead body produce no greater degree of ecchymosis, or cutaneous discoloration, than *slight* blows inflicted on the living. Assuming that the great extent of an ecchymosis would in all cases serve to show that the violence which produced it had been inflicted during life, it must be remembered that the importance of these facts in relation to medical evidence is not affected by the extent of the discoloration. It may be just as necessary to have a positive opinion on the origin of a *slight* as on the origin of an *extensive* bruise. Slight ecchymoses, as in cases of strangulation or suffocation, if they can be certainly pronounced vital, may make all the difference between the acquittal and conviction of a person charged with murder. Again, slight ecchymosis on the bodies of the drowned may excite a suspicion of strangulation and subsequent immersion of the body in water. So in reference to child-murder. An infant may be destroyed by violence, and only a few slight marks of ecchymosis be found upon its body. Irrespective of the *extent* of an ecchymosis, the great point for a medical witness to consider is, whether it occurred during life or after death. Cases in which a mistake might easily have arisen will be related in speaking of marks of violence on the drowned.

The practical inference is, that these discolorations of the skin caused after death are liable to be mistaken for marks of violence on the living body. An instance occurred in which, for the sake of experiment,

blows with a stick were inflicted on the recently dead body of a woman while still warm. The body was afterwards accidentally seen by non-professional persons, who were not aware of the performance of these experiments; and so strong was the impression from the appearances that the deceased had been maltreated during life that a judicial inquiry was instituted, when the circumstances were satisfactorily explained.

For our knowledge of the effects of bruising forces on the recently *dead* body we are greatly indebted to Christison. He found that blows inflicted on a dead body not more than *two hours* after death gave rise to appearances on the skin similar to those which resulted from blows inflicted on a person recently before death. The livid discoloration thus produced generally arose from an effusion of the thinnest possible layer of the fluid part of the blood on the outer surface of the true skin, but sometimes also from an effusion of blood into a perceptible stratum of the true skin itself. He likewise found that dark fluid blood might even be effused into the subcutaneous cellular tissue in the seat of the discoloration, so as to blacken or redden the membranous partitions of the cells containing the fat; but this last effusion was never extensive. From this, then, it follows that by trusting to external appearance only contusions made soon after death may be easily confounded with those which have been produced by violence shortly before death.

Violence inflicted on a living body may not show itself under the form of a bruise until *after death*. A man received several kicks on the lower part of the abdomen, which caused a rupture of the bladder and death from peritonitis. He died in about thirty-five hours; but there was no visible bruising in the seat of the blows—*i.e.*, in the pubic and lumbar regions—until after death. Hinze met with a case of suicidal hanging in which it was observed that ecchymosis appeared in the course of the cord only after death (see "Hanging"). A medical jurist must therefore guard against the error of supposing that when a blow has been inflicted on a living person it is necessary that the person who is maltreated should survive for a long period in order that a bruise should be produced. These facts simply prove that the cause producing the effusion of blood may operate during life, but there may be no appearance of it until after death. *Vide* also *supra*. This disposes of the theory that unless a person survives for some time after being subjected to severe blows no ecchymosis will be found on the body. Among numerous cases proving that this statement is not in accordance with facts may be mentioned that of the Duchess de Praslin (August, 1847). This lady, who was assassinated by her husband, was attacked while asleep in bed. The number of wounds on her person (thirty) showed that there had been great resistance, but the struggle from first to last could not have lasted more than *half an hour*. Yet on inspection there were the marks of numerous ecchymoses, which had resulted from the violent use of a bruising instrument ("Ann. d'Hyg.," 1847, t. 2, p. 377). Casper considered that a bruise required a certain time for its production, and that, if a person died speedily from the effects of violence, no ecchymosis would be found on the body, although the violence might have been of a bruising nature ("Handb. der Gerichtl. Med.," vol. 1, p. 121). The case of the Duchess de Praslin shows that this is not correct, and Casper himself has admitted

that effusion of blood may be produced as the result of violence applied to a recently dead body (see "Strangulation"), a result which is in accordance with other facts mentioned above. If an effusion of blood can be produced by violence to the recently dead body, it is clear that a continuance of life is not necessary for its production. The following case shows how these facts may be misapplied. A man was seen to strike one of his companions. The person struck died suddenly. On a post-mortem examination the mark of a bruise was seen over the sixth and seventh ribs on the right side. About a fortnight before this blow was struck the deceased had met with an accident: a heavy box fell on his right side, knocked him senseless, and nearly killed him. The question at issue was, whether the bruised mark on the side was owing to the blow struck shortly before the man died, or to the fall of the box upon his body a fortnight previously. It was suggested, on the authority of Casper, that, as the man died soon after the blow was struck, the ecchymosis could not have arisen from the blow, but that it was most probably due to the fall of the box a fortnight before (*Lancet*, 1870, 2, 35). Such a case does not present much difficulty. If the ecchymosed mark is blue or livid and without any marginal colours, it was probably the result of the blow struck just before death. If the blood is fluid at the time of the violence, and the small capillary vessels are torn through, a blow may cause effusion and the production of a bruise on the skin. The warm liquid blood thus effused will find its way into the cellular tissue, and produce the usual external appearance. If, in the case quoted, the bruise had been produced a fortnight before, it would have shown some changes of colour at the margin (*vide* "Colour of Bruises").

The editor must remark on the above that old medical jurists cannot have appreciated the mechanism of circulation whereby blood is effused when a bloodvessel is ruptured. This part of bruising is simple enough to understand from what is stated on pp. 427 *et seq.* The blood thus effused may easily take some time (hours at least) to soak into and through the tissues and appear on the surface as a bruise visible to the naked eye.

A point which seems to be still unsettled and much more complex, and at the same time of much more importance, is what would be the event under the following circumstances:—A person is bruised, let us say, severely, dies in a few minutes or an hour or two, so as to allow plenty of time for the effusion of blood into the bruised tissues, but is not found for some four or five days. What will be the colour of these bruises then, and would it be possible to say when they had been inflicted, *i.e.* at the time of the killing or some four or five days or even longer before? Would they be green and yellow, like an old bruise in the living, or would they be red or black? It is easily possible for such a case to occur, but the writer cannot find any facts or experiments bearing on the question.

For details on the differences between bruising and post-mortem hypostases *vide* "Hypostases."

2. **Retraction of Edges of the Wound.**—As we have already noted, the healthy skin is during life slightly on the stretch; the muscles are, too, in a similar condition of "tone." Consequently, if in a wound on a dead person we find the skin gaping and the muscles

retracted, we are justified in asserting that the wound was inflicted either during life or very soon after death, while the muscles were still contractile (*vide* Sect. V.) and while there was still local life in the skin. This statement must be modified by adding, if the wound is not in such a position and of such extent that the mere weight of the parts might have dragged it open.

On this point as well as incidentally on the other points the following experiments are valuable :—

In conjunction with Aston Key, the author performed some experiments on recently amputated limbs. *Two minutes* after a leg had been amputated a deeply incised wound was made in the calf. It must be borne in mind that in the case of an amputated limb blood will have drained from the severed member, and that the conditions are not precisely those of a wound inflicted after death upon the unsevered limb. At the moment that the wound was made the skin retracted considerably, causing a protrusion of the adipose substance beneath ; the quantity of blood which escaped was small ; and the cellular membrane, by its sudden protrusion forwards, seemed mechanically to prevent its exit. The wound was examined after the lapse of twenty-four hours ; the edges were red, bloody, and everted ; the skin was not in the least degree swollen, but merely somewhat flaccid. On separating the edges, a small quantity of fluid blood escaped, but no coagula were seen adhering to the muscles. At the bottom of the wound, however, there was a small quantity of coagulated blood ; but the coagula were so loose as readily to break down under the finger. In a second experiment *ten minutes* after the separation of the member from the body, a wound of similar extent was made on the outer side of the leg, penetrating to the deep-seated layer of muscles. In this case the skin appeared to have already lost its elasticity, for the edges of the wound became slightly everted, and scarcely any blood escaped from it. On examining the leg twenty-four hours afterwards the edges of the incision were pale and perfectly collapsed, presenting none of the characters of a wound inflicted during life. At the bottom of the wound, and enclosed by the divided muscular fibres, there were some coagula of blood ; but these were fewer than in the former experiment. A portion of liquid blood had evidently escaped, owing to the leg having been moved. Other experiments were performed at a still later period after the removal of the limbs, and it was found that in proportion to the length of time suffered to elapse before the production of a wound, so were the appearances less distinctly marked ; that is to say, the less likely were they to be confounded with similar injuries inflicted upon a *living* body. When the incised wound was not made until *two or three hours* after the removal of the limb, although a small quantity of liquid blood was effused, no coagula were found.

These experiments show that "very soon after death" must be confined to periods certainly not exceeding one hour or one and a half hours. This point is of more theoretical than practical importance, for if wounds be found on a dead body which might have been inflicted just after death, one is immediately confronted with the problem, "Who could have any possible interest in wounding a dead body ?" In bodies found in the water it has rather more practical bearing (*vide* "Drowning").

3. **Signs of Inflammation.**—It cannot be too much insisted upon that inflammation is a process which can only be carried on by living tissues; hence if we find about a wound any swelling, effusion of lymph or pus, adhesion of edges, it is not only certain that the wound was inflicted during life, but we may get some indication as to the time when it was inflicted (*vide* "Scars" and "When was this Wound Inflicted?").

4. **Signs of Repair.**—Scabs, granulation tissue, skinning over of a wound, prove even more conclusively than the above that it was inflicted during life.

If a wound be found without *any* of the above, it was certainly inflicted after death, but decomposition may easily have proceeded so far in a wound as to have destroyed the evidence; and if this be the case, let the medical man say so at once.

IF BEFORE DEATH, HOW LONG DID THE VICTIM SURVIVE?

With regard to a person still living, we have already (*vide* "When was this Wound Inflicted?" *ante*) discussed this question somewhat fully, so far as evidence will allow, and seen its practical bearing. When a person is found dead the question still maintains its importance, but from rather a different point of view, for it is now not so much the mere question of duration of survival, but rather of what could the victim have done after receiving the wound or injury, and therefore might perhaps with more propriety be put under the heading of "Was the Case Accident, Suicide, or Homicide?" though chronologically it is best considered here.

Acts of Volition after Reception of an Injury.

It is obvious that this question can hardly arise in connection with a large number of injuries. Even in cases of fractured legs the victims have been known frequently to drag themselves considerable distances. We shall discuss only the following:—

Injuries to head and brain.
Injuries to the throat.
Injuries to the heart.
Rupture of abdominal viscera.
Violent struggling after injury.

Injuries to the Head and Brain.—Cases frequently occur where a patient who had received a blow on the head has survived several hours or days, and after death such injury to the cranium has been found as would, if the person had been seen only when dead, have probably given rise to a medical opinion that he must have died instantly. On the other hand, a person may fall lifeless from a blow which would produce no appreciable physical changes in the cranium or its contents, yet in this case, if the facts had been unknown, it would have been said the person might have survived some hours or days. Thus we see that it is by no means easy to determine from an examination of a wound in a dead body how long the person lived after its infliction. But it must not be understood that an opinion on this subject is never to be expressed from the nature and extent of an

injury, but what should be impressed upon a medical jurist is, that it must not be hastily given. A wound may be mortal, but it by no means follows that it should have destroyed life instantaneously.

The medical opinion, in an abstract question of this kind, is commonly based on individual experience, but the real question is not whether the witness himself has seen such a case, but whether such a condition of things is medically possible. A witness is allowed to express an opinion from general professional knowledge and experience.

The fact that a person after receiving a blow on the head sometimes recovers consciousness and performs acts of volition, but subsequently again becomes unconscious, is now used as an ordinary point of differential diagnosis between meningeal and cerebral hæmorrhage, the recovery very likely occurring in the former case, and not in the latter.

Speaking then in general terms, it must be allowed that even extensive damage to the brain is no proof that the victim died instantaneously, nor that he could not have performed many acts after the injury. The locality of the brain which is injured will in a few cases enable us to express a decided opinion, though one of the cases detailed below shows that even this rule is not without exceptions.

In *Reg.* v. *Milner and others* (Derby Sum. Ass., 1854), in which a Mr. Bagshawe had been assaulted by the prisoners and had died from the injuries sustained, it was proved that the temporal bone was beaten in, the base of the skull fractured, and there was a large coagulum of blood effused on the left side of the brain, which by its pressure had flattened this organ. Notwithstanding these injuries, the deceased walked a considerable distance, and he survived about twelve hours.

A man was found dead in a stable with a severe fracture of the temporal bone, which had caused a rupture of the middle artery of the brain. A companion was accused of having murdered him, but he alleged that the deceased had fallen from his horse the day before, and had thus met with the accident. It appeared, however, that after the fall the deceased had gone into a public-house before he returned to the stables, and had remained there some time drinking. The question respecting the guilt of the accused party rested upon the fact whether after such an extensive fracture of the skull, with extravasation of blood, it was possible for a man to do what the prisoner had represented the deceased to have done. Wallace gave a qualified opinion; he said it was improbable, but not impossible, that the deceased could, after receiving such an injury, have walked into and drunk at a public-house. The extravasation was here the immediate cause of death, and probably this did not take place to the full extent, except as a consequence of the excitement from drink.

In 1899 the editor attended at the Central Criminal Court to give evidence in the following case. Two men quarrelled in a public-house; one struck the other in the face with an umbrella. The victim not only walked from the cab into the London Hospital, but showed so little sign of brain injury that he was allowed to go home, and symptoms did not set in for forty-eight hours, during which he walked and talked as usual. On autopsy the end of the umbrella, four and a half inches in length, was found embedded in the bones of the base of the skull, and had penetrated completely through the Pons Varolii (a region of the junction of brain and cord, usually considered a very fatal region).

Cut Throat.—A man is found dead in his chamber with his throat cut, and the incision is proved to involve one or both carotid arteries. The medical inference is that he must have fallen dead on the spot, and that he could not have survived an instant. If this be true, the weapon ought, of course, to be found either in the hand of the deceased

or close to his body, but it is lying in another room, and there are marks of blood between the two rooms. What, then, is the conclusion? Either that the medical opinion is erroneous, and the deceased could not have dropped down dead *instantly*, or that he must have been murdered. Unless circumstances tend to expose the error of the medical statement, irreparable injury may be done to an innocent person. The medical opinion has always given way when circumstances refuting it appeared, but it is the duty of a medical jurist to profit by such errors, and to apply his opinions with greater caution to similar cases.

Wounds of the carotid arteries are often pronounced *instantaneously* mortal. It occasionally comes out on inquiry that, if such a wound had been instantaneously mortal, then, in defiance of rational probability or of the strongest presumptive evidence to the contrary, the deceased must have been murdered. An opinion of this kind has not only been refuted by circumstances, but by the evidence of eye-witnesses. A medical witness is then compelled to admit that his rules for judging of the mortality of wounds are wrong, and that the person may have survived for a longer or shorter period.

There is one circumstance which requires notice in relation to severe wounds in the *throat*—namely, that, although a person may have the power of locomotion, he may not be able to use his voice so as to call for assistance. A murder may, in this way, be quietly committed without persons in an adjoining room hearing any noise, but the fact is that when the windpipe is divided, as it generally is on these occasions, the voice is lost. Wounds involving the windpipe and gullet are not necessarily fatal if the large bloodvessels escape injury.

There are several cases on record which show that wounds involving the common carotid artery and its branches, as well as the internal jugular vein, do not prevent a person from exercising voluntary power, and even running a certain distance.

In 1863 a man committed suicide by cutting his throat. The external carotid artery and the jugular vein on the right side were cut through, and a large quantity of blood was lost. The wound extended from the front of the angle of the right jaw to near the windpipe, which was not wounded. The man survived half an hour, but he was speechless and insensible. The bleeding had been partly stopped by a cloth thrust into the wound. It was left doubtful by the evidence whether this wound was inflicted by himself or by another.

In the case of *Rex* v. *Danks* (Warwick Lent Ass., 1832), it was proved that the deceased had died from a wound in the throat inflicted by the prisoner, which divided the trunk of the carotid artery, the principal branches of the external carotid, and the jugular veins. The evidence rendered it probable, if not certain, that, after the infliction of this wound, the deceased had been able to run twenty-three yards and to climb over a gate, the time required for the performance of such acts being at least from fifteen to twenty seconds. Most medical witnesses would have probably given an opinion that the deceased could not have moved from the spot where such a wound had been inflicted; but it was clear that she had gone this distance. There was no dragging of the body and no motive for its being dragged by the prisoner, and exposed in an open road, where it was found (*Med. Gaz.*, vol. 10, p. 183).

In December, 1903, a girl was brought into the London Hospital with the left internal jugular vein cut through and the left common carotid severed all but a small fragment of tissue. Her throat had been cut by a jealous lover, who had also gashed the back of her neck.

Notwithstanding these severe wounds, she had run about sixteen yards into a public-house before falling down. She died in about two minutes.

The following case is communicated to the editor by Dr. Nelson Hardy :—

A rather remarkable case of suicide came under my observation in 1883. A city clerk, who had not been a month married, coming home one evening in January at his usual hour, found his house in darkness and his wife, its sole occupant, lying dead upstairs. He communicated with the police, who sent for me, and I found in the back kitchen on the ground floor a sink containing a quantity of blood clot, a small looking-glass and a razor, both blood-stained. Upstairs, in the front bedroom, we found the body lying sideways on a chair, the head resting on the bed. A wound, two inches long, extended across the throat from left to right, partially severing the windpipe and dividing a number of bloodvessels on each side. Her clothes about the neck and chest were saturated with blood. There were blood-stains on the bed and some on the stairs and passages. It seemed wonderful that while alone in the house she could have walked without assistance from the sink downstairs up to the bedroom with such a wound in her throat. Rigor mortis not having set in, but the blood on her neck being quite dry, I supposed she must have been dead for some three or four hours. The wound was such as might have been self-inflicted, and at the inquest a verdict of suicide was recorded. I heard afterwards from one of her relatives that she had been much attached to a soldier, but was induced by her friends to accept her other suitor as being a better match, and that this was the only cause that could be suggested for her taking her own life.

Wounds of the Heart.—Every penetrating wound of the heart was formerly considered to be instantaneously mortal, and the usual medical opinion at coroners' inquests was that a person so wounded must have dropped down dead on the spot. More accurate observations have, however, shown that this is an erroneous doctrine. The Duc de Berri, who was murdered in Paris in 1820, survived eight hours after having received a wound in the left ventricle of the heart. When the cavities of the heart are extensively laid open, death is likely to be an immediate result; but persons who have sustained wounds of this organ have frequently lived sufficiently long to exercise the power of volition and locomotion. Watson met with a case in which a man who had been stabbed in the right ventricle ran *eighteen yards* after having received the wound. He then fell, but was not again able to rise; he died in six hours. On dissection it was found that a punctured wound had extended into the right ventricle in an obliquely transverse direction, dividing in its course the coronary artery. The pericardium was nearly filled with blood, and about four pounds were effused on the left side of the chest ("On Homicide," p. 98). A remarkable case of the preservation of volition and locomotion after a severe wound of the heart will be found reported in the *Med. Gaz.* (vol. 14, p. 334). In this case the patient, a boy, survived five weeks, and employed himself during that period in various occupations. After death a mass of wood was found lodged in the substance of the heart. Had this boy been found dead with such an injury, it is most probable the opinion would have been that his death was instantaneous. Darling, of New York, had a case, which occurred in 1855, in which a man survived for a period of *eleven days* a bullet-wound of the heart. Soon after receiving the wound he became senseless, cold, and pulseless, and remained in this collapsed state for four hours. He then rallied, but

died on the eleventh day. On inspection there was no effusion of blood; the pericardium was much distended with serum, the result of inflammation. A bullet, one-third of an inch in diameter, was found lodged in the fleshy partition between the right and left ventricles, about midway between the apex of the heart and base of the ventricles. There was no communication with the cavities; the wound had entirely cicatrised; and inflammation of the pericardium was obviously the cause of death. Some years ago a man was admitted into Guy's Hospital who survived twenty-four hours after the infliction of a penetrating wound of the left ventricle.

The keeper of a brothel was tried in Glasgow, in the year 1819, for the murder of a sailor by shooting him through the chest. The auricles and part of the aorta next to the heart were "shattered to atoms" by the slugs and brass nails with which the piece was charged; and, in the opinion of the medical witnesses, the deceased must have dropped down dead at the moment that he received the shot. The body was found in the street, and the door of the prisoner's house was *eighteen feet* up an entry; so that it followed, if the medical opinion was correct, that the prisoner must have run after the deceased, and shot him in the street. For the prisoner it was urged, and proved, that he had shot the deceased through the door of his own house, which the latter was attempting to enter by force. Besides direct testimony to this effect from those within the house, and from a lad who was with the deceased at the time, it was proved that there was a stream of blood from the door of the house to the spot where the body lay, which could not have flowed from the body towards the house, as the threshold of the door was on a higher level than the pavement of the street. On this evidence the prisoner was acquitted. If, by the heart "being shattered to atoms," we are to understand that its cavities were entirely laid open, and its substance destroyed, we have a description of wound which most professional men would not hesitate to pronounce instantaneously mortal. Although nothing is stated on the point, yet we must suppose it was proved before the question of survivorship was raised that the body of the deceased could not have been dragged after death from the door of the prisoner's house to the spot where it was found, a circumstance which would have sufficed to account for the presence of a stream of blood, notwithstanding the difference of level between the street and the door of the house. The jury found that, in spite of the severe wound, the deceased had had the power to run into the street after having been shot through the door of the prisoner's house.

In 1854, an Italian, æt. 38, discharged a brace of pistols into his chest on the left side. The man was brought into Guy's Hospital, and was able to converse on his condition, and lived one hour and fifteen minutes after the infliction of the wound. After death it was found that one bullet had perforated the pericardium, entered the right ventricle, and, after traversing the septum of the ventricles, made its exit from the heart at the junction of the left auricle with the ventricle. It traversed the upper lobe of the left lung, and was found fixed in one of the vertebræ of the back. The second bullet perforated the left ventricle, and then traversed the left lung. This wound was

of such a nature that, at every contraction of the ventricle, the opening must have been closed so as to arrest the flow of blood. This man, owing to severe suffering, rolled about the floor, and was with difficulty kept quiet. It will be seen that in this case there were bullet-wounds traversing completely the cavities of the heart; yet the man could talk and exert himself, and he actually survived their infliction *one hour and a quarter*. Had the body been found dead in a suspicious locality, the discovery of such wounds in the ventricles of the heart might probably have led to a hasty medical opinion that the death of the man must have been instantaneous. In these cases, little or no blood probably escapes from the heart in the first instance, but it may afterwards continue to ooze gently, or suddenly burst out in fatal quantity. It must not, therefore, be supposed when a person is found dead with a wound of the heart, attended with abundant hæmorrhage, either that the flow of blood took place in an instant, or that the person died immediately and was utterly incapable of exercising any voluntary power. Only one condition will justify a supposition of this kind; namely, when the cavities of the organ are largely laid open. This remark applies especially to wounds of the auricles, which have but little contractile power.

Of late years many cases have been reported in which recovery has taken place after wounds of the heart. Amongst others one occurred in the London Hospital under the care of Mr. Furnivall in 1903. For a successful operation on a wounded heart *vide* also *B. M. J.*, Epit., 2, 1903, p. 70.

Ruptures of the Diaphragm.—A rupture of the *diaphragm* has been considered sufficient to deprive a person of the power of locomotion; but there appears to be no good ground for this opinion. The general effect of such an injury is to incapacitate a person; but still in some cases a power of moving and walking may be retained after a rupture of this muscle. In the following instance, reported by Devergie, the proof of locomotion was material:—An intoxicated man, after having been maltreated by another, returned home, walking for at least two hours with two companions. The man died in fifteen hours; and on inspection, among other severe injuries, there was found a recent longitudinal rupture of the diaphragm about two inches and a half in extent, and the stomach protruded through the aperture. The question was, When could this rupture have taken place? for it was undoubtedly the cause of death. Was it possible for a person, with a recent rupture of the diaphragm, to walk for two hours? The medical witness admitted the possibility of the deceased being able to walk under the circumstances, but he thought it very improbable. There was no evidence to show that the deceased had been attacked or beaten by his two companions in journeying homewards; and, therefore, there could be no reason for inferring their guilt simply because locomotion after such an injury was something unusual as a matter of medical experience. This injury is far from being immediately or even speedily fatal, as was formerly supposed. In January, 1847, a man fell from a height of twenty feet. He had fractured both arms, and had sustained other severe injuries. On the day after admission into the hospital he complained of a fixed defined pain on the left side. He survived

about thirteen weeks. On inspection the diaphragm was found lacerated in two places, in one to the extent of an inch and in the other to the extent of six inches (*Med. Gaz.*, vol. 39, p. 205). In a case admitted into Guy's Hospital, the patient survived the only accident which could have produced the rupture for at least *nine months*. The man had fallen on the deck of a vessel from a great height six months prior to his admission. His ribs were fractured, and one ankle was so injured as ultimately to render amputation necessary. The man sank under the operation three months after admission; and on inspection it was found that the stomach and the colon occupied the left side of the chest, having protruded through an aperture in the muscular part of the diaphragm, two and a half inches in extent. This hernia was evidently of old standing, as the aperture was cicatrised, and the omentum adhered to it. The existence of this injury was quite unexpected, and at the time of admission there was nothing to interfere with locomotion and exertion except the injury to the ankle (Guy's Hosp. Rep., 1838, p. 368). *Vide* also cases in "Is this Wound Dangerous to Life?"

Ruptures of the Liver, Spleen, or Kidneys, unless attended at once with great loss of blood, do not prevent a person from exercising muscular power. In the case of Gordon (Glasgow Spring Circ., 1856), it was proved that the deceased had died from ruptured liver; but, after sustaining the violence, he had been able to reach home on foot, although with some difficulty. This question of survivorship in reference to ruptured liver, and the time required for fatal effusion of blood to take place, may have an important bearing in a charge of murder (see *Reg.* v. *Phillips*, Liverpool Wint. Ass., 1863).

Ruptures of the Bladder.—In ruptures of the *bladder*, attended with extravasation of urine, a question may arise respecting the retention of the power of locomotion. The following cases will show that this power exists, although the result, in some cases, may be to incapacitate the person from moving. A man, æt. 31, while intoxicated, received a blow on the lower part of his abdomen. He was sobered by the accident, and walked home, a distance of a quarter of a mile, although suffering severe pain. When seen in the evening, twelve ounces of bloody urine were drawn off by a catheter, and he complained of having felt cold immediately after he had received the blow. He died four days after the accident. On inspection there was no mark or ecchymosis on any part of the abdomen. The bladder was ruptured in its upper and back portions for about an inch (*Lancet*, May 14th, 1842). A gentleman who had been compelled to retain his urine fell accidentally in descending a staircase, with the lower part of his abdomen against the edge of one of the steps. The sense of fulness in his bladder immediately ceased, and he walked to a friend's house to dinner. The nature of the accident was mentioned to a surgeon there present, who immediately suspected that the bladder must have been ruptured. The case terminated fatally in twenty-four hours. A case is reported in which a man walked a distance of two miles after having sustained a rupture of the bladder; and in another the man, who sustained the injury in a scuffle, was able to walk between two and three hours after the occurrence. See also *Lancet*, October 31st, 1846,

p. 480. Thus, then, from these various instances, it is evident that locomotion and muscular exertion may take place after an accident of this description. The medico-legal relations of this subject will be apparent from the following case, reported by Syme. A man passed some hours convivially with a few friends, after which a quarrel ensued, blows were exchanged, and the parties wrestled with each other. The deceased then walked home, a distance of more than a mile; and in crossing the threshold of his own door he fell forwards on his abdomen. When lifted up he complained of great pain, and was put to bed, being quite unable to exert himself. He died in two days, and upon dissection the bladder was found ruptured at its upper part (fundus) to the extent of between two and three inches. Under these circumstances, it became a question whether the rupture was caused by the violence of his companions, or by the accidental fall at the door of his own house. If by his companions, he must have walked more than a mile with his bladder ruptured; but two medical witnesses declared that he could not have walked this distance after the rupture, and consequently that it must have been occasioned by the subsequent fall. The symptoms of rupture and extravasation of urine occurring immediately after the fall rendered it highly probable that this accident was really the cause. At the same time it is obvious that the power of locomotion may be exerted under such circumstances to a much greater extent than is commonly supposed.

The question is sometimes restricted to the mere possibility of *survivorship for a given period* without active exertion. If the power of locomotion is retained under severe injuries to important organs, there can be no difficulty in supposing that life may continue for a longer or shorter time when the person remains in a quiescent state. A witness must always be prepared to make full allowance for acts indicative of life in persons severely wounded.

Struggling after Severe Wounds.—The power of moving, if not exerted to a large extent, may take place in a small degree; and this may become occasionally a material question in legal medicine. Thus it must not be lost sight of when we are drawing inferences as to the relative positions of an assailant and a murdered person from the situation in which a body is found. A dead man with a mortal injury to the head or heart may be found lying on his face when he actually fell upon his back, but still he might have retained sufficient power to turn over before death; or he may have fallen on his face, and have afterwards moved, so that his body may be found lying on the back. A slight motion of this kind is very easily executed; it does not always depend on volition. Individuals suffering from severe concussion have been frequently known to perform acts unconsciously and automatically. The cases above related may perhaps be considered rare, and as exceptions to the general rule. The medical jurist must bear in mind, however, that he is not required to state in how many, out of a given number of persons similarly wounded, this power of performing acts indicative of volition and locomotion may remain, but simply whether the performance of these acts is or is not *possible*. It is on this point only that the law requires information. The hypothesis of guilt, when we are compelled to judge from circumstances in an unknown case, can only be received

on the exclusion of every other reasonable explanation of the facts. On surgical opinions or treatment such cases, from their rare occurrence, may have little influence; but in legal medicine the question is widely different. Medical facts, however rare, here admit of a very important and unexpected application.

Although, in cases of severe wounds, we may allow that persons may survive for a sufficiently long period to perform various acts of volition and locomotion, yet the presence of a mortal wound, especially when of a nature to be accompanied by a great loss of blood, must prevent all *struggling* or violent exertion on the part of the wounded person; such exertion we must consider to be quite incompatible with his condition. A medical jurist may thus have it in his power to determine whether a mortal wound found on the deceased has been inflicted for the purpose of murder, or in self-defence. A man was tried (Lancaster Ass. in 1834) for the murder of a woman at Liverpool by stabbing her in the chest. The prisoner and the deceased, with two other women, were quarrelling in the passage of a house. A struggle ensued between the prisoner and the deceased, which one of the witnesses said lasted for *ten minutes*. When the prisoner had reached the door, he pulled out a knife and stabbed the deceased in the chest. She fell, and died almost immediately. The prisoner alleged that he was attacked by several persons, and that he stabbed the woman in self-defence. The judge said if the blow had been struck with premeditation before the struggle, the crime would be murder; if during the struggle, it would be manslaughter. The medical evidence showed that the blow could not have been struck before the struggle, because it was of a speedily mortal nature; and the deceased would not then have been able, as it was deposed to by the witnesses, to struggle and exert her strength with the prisoner for *ten minutes* afterwards. This being the case, it followed that in all probability the deceased had received the wound towards the conclusion of the quarrel; and therefore it might have been inflicted while the prisoner was attempting to defend himself. The jury returned a verdict of manslaughter.

A case involving this question was tried at the Gloucester Lent Assizes, 1843 (*Reg.* v. *Hobbs*). The prisoner was indicted for the wilful murder of a man with whom he had been drinking and quarrelling. It appears that in the early part of the quarrel the deceased threw the prisoner down and struck him. The deceased was told by the landlord of the inn to go home. He replied, "Very well," and then, leaving the prisoner, went through the entrance-arch of the inn up the yard. In about *seven minutes* the deceased, who had complained to the landlord of the maltreatment which he had undergone, returned into the inn-yard, and was seen on entering it to pull down his waistcoat and button his coat. A witness advised him to go home, and he left the spot. A short time afterwards he was found at the back of the yard, lying dead on his face. On examining the body it was ascertained that the deceased had been stabbed in two places, one of the stabs having penetrated a ventricle of the heart. On apprehending the prisoner a large clasp-knife was found in his pocket, stained with blood. The prisoner admitted that he had stabbed the deceased, but said it was *during the quarrel*, and that he had used the knife in

self-defence while they were on the ground. For the prosecution it was contended that the deceased had been stabbed by the prisoner subsequently to the quarrel—that he had gone through the gate into the yard to meet the deceased, had there stabbed him, and had caused his instant death. A medical witness who was called stated at first that from such a wound death must have been *instantaneous*. In cross-examination, however, he admitted that the deceased might have lived some time after he had been stabbed; and on this evidence the prisoner was convicted of manslaughter, and sentenced to six months' imprisonment. The medical facts of this case are imperfectly reported; hence it is difficult to give a decided opinion respecting the time at which the deceased was stabbed in the heart. The size of the stab in the ventricle is not stated, nor is it in evidence whether any blood was found on the spot where the deceased was struggling with the prisoner. That the deceased should have struggled with the prisoner for one minute after he had been stabbed in a ventricle of the heart is contrary to medical experience and probability. It is also irreconcilable with the existence of such a wound that the deceased should have been stabbed in the heart without knowing it, or without being aware of his condition; that he should have been able thereafter to walk away through the inn-yard to the house, and survive seven minutes while thus walking. Taking the facts as reported, it appears that it is probable that the deceased was stabbed by the prisoner subsequently to the quarrel, while he was walking in the inn-yard. The only circumstances in favour of the defence were the prisoner's statement and the fact that, in some rare cases, wounds of the heart do not prove immediately fatal.

In the case of *Reg.* v. *E. M. Brown* (Dorchester Sum. Ass., 1856), the prisoner was charged with the murder of her husband by blows on the head while in her room. Her statement was that the violence on the head was produced by the kick of a horse. The medical evidence showed that the bones of the nose were broken; there was a triangular wound exposing the bone above the left eyebrow, another triangular wound exposing the bone at the top of the head, and a third wound at the back of the head. The left ear was perforated; and behind it was a long wound divided into two. The frontal bone was fractured from the orbit through the parietal into the occipital bone. Seven pieces of bone, varying in size from half an inch to three inches, had been driven into the brain, and a large quantity of blood was effused. The prisoner's account was that she found her husband thus wounded and bleeding outside the house, that she dragged his body into an inner room, and, further, that, though thus wounded, he held her tightly by the clothes for two hours afterwards. It was proved that there was no blood over the front of the person or dress of the deceased, and that there was no blood in the passage or in any part of the house, except in the room where the body was found lying. Further, the injuries were not such as a kick from a horse would explain; and the medical witness properly stated that a man thus injured could not have held the prisoner by the clothes for two hours, so as to prevent her from seeking earlier for assistance. These facts showed that the deceased had been killed by blows where the body was actually found. The prisoner was convicted.

WAS THE WOUND THE RESULT OF ACCIDENT, SUICIDE, OR HOMICIDE?

Supposing that the wound which is found on a dead body is proved to have been caused before death, it may be necessary to inquire whether it was the result of *suicide*, *homicide*, or *accident*. It might at first sight be considered that the determination of a question of this nature was wholly out of the province of a medical jurist. In some instances it may be so, and the settlement of it is then left to the legal authorities; but in a large number of cases it is so closely dependent for its elucidation on medical facts and opinions, that juries could never arrive at a satisfactory decision without medical evidence. Let us suppose, then, that a medical jurist is consulted in a doubtful case. What are the points to which he should direct his attention?

1. There must be no disturbance of the body.

Evidence from Wounds.

2. Suicidal *v.* accidental wounds.
3. Accidental stabs.
4. Evidence from the situation of the wound.
5. Evidence from the nature and extent of the wound.
6. Evidence from the direction of a wound: stabs.
7. Evidence from multiplicity of wounds: two or more mortal wounds; which was first inflicted? foreign bodies in wound.

8. Evidence from the surroundings: position of body and clothes; blood marks on body and in room. Evidence from the furniture, etc.: quantity and position of blood.

9. Evidence from the weapon: position; nature of edge; blood on it; several weapons; hairs and other foreign particles on a weapon.

10. Evidence from an examination of the assailant.

The editor from his lectures inserts the following brief epitome of evidence as affording a useful reference table:—

Evidence may be derived from—

(*a*) Position of body and clothes.	(*a*) Much contorted and disturbed, and clothes much disarranged (evidence of a struggle), is *primâ facie* evidence of homicide. Note the amount and especially the position of the blood, and consider how it arrived at its situation.
(*b*) Wounds and bruises:— 1. Number.	(*b*) 1. Many slight wounds often indicate suicide; if two or more important organs are wounded it is suggestive of an impatient suicide. Many wounds on hands may be from attempts at protection, or from drawing out a weapon in suicide (known). *Per contra*, many deep wounds may suggest brutal violence.

(*b*) Wounds and bruises—*contd.*	
2. Position.	2. There is hardly a position, even in the back, in which a lunatic may not contrive to wound himself suicidally, but a wound running *upwards* is not likely to be suicidal. Hammering on the head, driving in of nails, chisels, etc., are lunatics' tricks; wounds of genitals are usually suicidal in men, at any rate: in women, this is not so true. Tidy says there is no position of a wound which a murderer cannot imitate if he has time. Consider his time and the knowledge of anatomy he possesses.
3. Nature.	3. Bruises are rarely suicidal except in lunatics; but dynamite in the mouth and red-hot irons driven into abdomen are occasionally resorted to by suicides.
4. Direction and depth.	4. A cut is usually shallower at the end last made; hence frequently it is possible to tell whether a wound was made from left to right or *vice versâ;* but remember an assailant's hand from behind coming in front acts like one's own hand starting in front. Homicidal cut throats are usually more horizontal and more undercut; suicidal ones, at least usually, run a bit upwards; suicidal stabs are usually on the left side, *i.e.*, made with right hand and run downwards and inwards. A determined suicide may actually notch the vertebræ in cutting his throat, but consider the sharpness and weight of weapon and the strength of the victim.
5. Bruises, finger-marks, etc.	5. These want explanation either from violence of attack or defence.
6. Direction of flow of blood.	6. Will possibly give a strong clue to the position of the victim, which may be important.
(*c*) Surroundings:— Furniture.	(*c*) In disorder, finger-marks on it (Galton's thumb-marks, *vide* "Identity"), broken, etc., as evidence of struggle.

(*c*) Surroundings—*contd.*	
Floor.	Bloody footsteps, etc.
Weapon.	Blood or hair, etc., on it; gripped or not in the hand (*vide* "Rigor Mortis"); if absent, why absent? thrown away or hidden, etc.; if present, its position, etc.
(*d*) The accused.	(*d*) Blood on him, his physical power, motives, and general evidence all come in here.

1. The Body must not be disturbed.—It is important on these occasions that there should be no disturbance of the body, of the weapon, articles of furniture, or other matters in the immediate vicinity. If the body or the weapon has been carelessly removed, or the arrangement of the clothes altered, this may materially affect a medical opinion. There is no case in medical jurisprudence in which the rule *Prius est de crimine quam de reo inquirendum* is more rigidly enforced than in reference to these wounds of the throat, whether the wounded person survives or dies. Hence much consideration is required before we come to the conclusion that the act was certainly homicidal. It will greatly aid the effect of medical evidence in reference to the situation and direction of wounds in this part of the body, if at the time of inspection a rough diagram of the neck in its fore and back parts is made, and lines are so carried as to indicate by arrows the direction which the weapon is supposed to have taken. A court will thus be able to follow more completely the description given by a medical witness, and to appreciate more readily the reasons which he assigns for his opinion. It would be well if, before a body is moved, a photograph could be taken of the attitude and position of surrounding objects in relation to it.

Evidence from the Wound or Wounds.

2. Suicidal and Accidental Wounds.—It is not often that any difficulty is experienced in distinguishing a *suicidal* from an *accidental* wound. When a wound has really been suicidally inflicted, there are generally to be found about it clear indications of design; and the whole of the circumstances are seldom reconcilable with the supposition of accident. But if the position of the deceased with respect to surrounding objects has been disturbed, if the weapon has been removed, and the body transported to a distance, then it will not always be easy to distinguish a wound accidentally received from one inflicted by a suicide or a murderer. The evidence of those who find the body can alone clear up the case; and the medical witness may be required to state how far this evidence is consistent with the situation, extent, and direction of the wound by which the deceased has fallen. It is unnecessary to dwell further on the subject, since the observations already made will suggest to a practitioner the course which he should pursue. Circumstantial evidence is commonly sufficient to show whether a wound has been accidentally received or not; but as an accidental wound may sometimes resemble one of homicidal or suicidal

origin, so it follows that it is not always possible for a medical jurist to decide the question peremptorily from a mere inspection of the wound.

It would not be difficult to produce instances in which murderers in their defence have alleged that the wounds observed in the bodies of their victims were of accidental origin, and the allegations have been clearly refuted by medical evidence. A witness must be prepared, therefore, in all cases in which death has taken place in secrecy, and the nature of the wound is such as to render its origin doubtful, to be closely examined by counsel for a prisoner charged with homicide on the question whether the wound might not have been accidental. The law requires that it should be rendered evident to a jury, before such a charge can be sustained, that the fatal wound could not have had an accidental or suicidal origin.

The death of a person from wounds has hitherto been considered as a subject connected with a criminal charge; but an investigation of the circumstances under which death ensues is occasionally rendered necessary when the deceased has effected an insurance upon his life. A policy of life insurance is in some cases rendered void by the act of self-destruction; and therefore a person bent on suicide might, for the sake of his family, take precautions to conceal the manner in which he intended to destroy himself. His body might be found wounded in a way which would render it uncertain whether he had been wounded accidentally, whether he had been murdered, or whether he had fallen by his own hand. It is incumbent on the insurance office in a disputed case to prove the act of suicide, while the relatives of the deceased would attempt to show the contrary. Such litigation must, of course, call forth a deep and searching investigation into all the circumstances connected with the death of the insured, and the whole case would, in some instances, rest almost exclusively on medical evidence (*vide* under "Insurance"). Numerous cases have occurred in England which will illustrate the importance of attending to the precise character of wounds and the circumstances under which the body of a wounded person is found.

3. **Accidental Stabs.**—Severe incisions on vital parts do not often happen by accident, but severe punctures and stabs affecting vital organs have frequently an accidental origin. These stabs arise generally from falls while the person is in the act of running with a pointed instrument in his hand or his pocket. There is one character which, when thus produced, they are commonly observed to possess, namely, that their direction is from below upwards. In this way the truth of a defence may be sometimes tested, as when a prisoner alleges that the deceased threw himself or fell upon the weapon. Homicidal stabs may be likewise directed from below upwards; but this is somewhat rare and not probable, unless the person is stabbed by an oblique blow while in the recumbent posture. Rules of this kind may appear to be susceptible of but little practical application; yet cases occasionally present themselves wherein a close attention to situation and direction may materially assist in forming an opinion. In a case of alleged murder, which was tried in 1843 at the Central Criminal Court, a surgeon deposed that he found, on examining the body of the deceased, a stab on the left side of the chest, near the armpit, about six inches in depth.

It had wounded the lung, and had penetrated obliquely into the right auricle of the heart, passing from left to right. He properly contended that, considering the situation and direction of this wound, it was very improbable that the deceased could have inflicted it upon himself. The fact that there may be some instances in which rules of this kind will not be applicable must not deter us from endeavouring to make a cautious application of them in doubtful cases.

The following cases show how accidental may simulate homicidal stabs:—

A blacksmith, while forging a piece of rod-iron, was irritated at some observations made by a bystander. He made a rush at the offender with the heated iron in his hand, the end being red-hot; he stumbled and fell. In some way the piece of iron became accidentally reversed; he fell upon the red-hot point, which struck against a portion of the breast-bone, glanced from that, and penetrated the upper part of the left lung. He died in a few days, and the body was examined.

Had only one person been present when this circumstance occurred, a charge of murder might easily have arisen, and the medical and circumstantial evidence might have appeared to favour this view (*Dublin Med. Press*, January, 1845). How could such an occurrence have taken place by any conceivable accident? Cooper related a case in which a man accidentally inflicted upon himself a stab under very singular circumstances.

In 1843 a man was brought to Guy's Hospital with a punctured wound in the back, between his shoulders. It had been inflicted by a stonemason's chisel. The instrument had penetrated to its head, which had prevented it from going further, and had entered the chest, producing a severe wound, as it was supposed, of the lungs, attended with copious hæmorrhage. It appeared that the man had been drinking and quarrelling with some companions. He had fallen from a blow, but did not complain of being stabbed, and was conveyed home. His wife, on removing his coat, found that his waistcoat and shirt had been penetrated by the chisel, which was still sticking in his back, but the outer coat had not been cut or perforated by it. She withdrew the instrument, when copious bleeding came on, and he was sent to the hospital. The person with whom he had fought was charged with having stabbed him; and it was clear that such a stab must have been either homicidal or accidental. It was elicited from witnesses, however, that no weapon was seen in the hands of the accused; that the chisel belonged to the wounded man, and that he used it in his trade as a stonemason; there were no marks of blood on the floor where he fell, or on his clothes; that after leaving the public-house where the quarrel took place he walked with a policeman, who said that the man exhibited no signs of having been wounded, and did not complain of having been struck by any weapon. These facts seemed to show that the stab must have taken place after the quarrel; it was further proved that the wounded man had the chisel in his pocket before the quarrel, and that, as the outer coat had not been cut, a homicidal stab could only have been inflicted by the assailant raising this, which was altogether improbable; and then it would remain to be explained how the weapon could have penetrated up to its head. From the whole of the facts it was considered that this must have been an accidental stab, although its direction was remarkable, since, according

to the wife's statement, the weapon had not entered the body in a slanting direction, but straightforward, and it required considerable force to remove it. The man recovered, and from the statement which he made there could be no doubt that it was an accidental stab produced by a fall; but it was certainly extraordinary that it should have been found in such a situation and taking such a direction. On these investigations some regard must always be had to the helpless state of intoxication in which a wounded person may be. This may give an anomalous character to accidental stabs or punctures, and render a man unconscious of a severe injury. The case further illustrates the importance of examining the dress. Had the act been homicidal, the coat would have been found perforated.

4. **Evidence from the Situation of a Wound.** — It is a general principle in which most medical jurists agree that wounds inflicted by a suicide are usually confined to the fore or lateral parts of the body. The throat and chest are commonly selected when cutting instruments are employed; while the chest, especially in the region of the heart, the mouth, the orbit, and the temples, are the spots generally chosen for the perpetration of suicide by firearms. But it is obvious that any of these parts may be also selected by a murderer, with the especial design of simulating a suicidal attempt; therefore the mere situation of a wound does not suffice to establish the fact of suicide. Smith considered, in reference to pistol wounds, that if the weapon has been introduced into the deceased's mouth, and there discharged, we may take it for granted that "it has not been done by another" ("For. Med.," p. 302); but this inference has been too hastily drawn, because it is quite within the range of probability that a calculating assassin may purposely resort to this method of destroying a person in order to conceal the crime. In suicidal wounds from firearms, a discoloration by powder of the fingers of the hand which discharged the weapon is sometimes observed; this has also been looked upon as a source of evidence of suicide under doubtful circumstances, but a similar objection, although not with equal force, might be made to its admission. Some have regarded it as fully established in legal medicine that when wounds exist at the back part of the body it is a positive proof that they have not been self-inflicted. This situation is certainly unusual in cases of suicide; but, as Orfila observes, it is not the situation so much as the direction of a wound which furnishes evidence against the presumption of suicide. A wound, traversing the body from behind forwards in a direct line, is not likely to have resulted from a suicidal attempt; at least it must be obvious that it would require more preparation and contrivance on the part of a self-murderer so to arrange matters that such a wound should be produced than we can believe him to possess at the moment of attempting his life. It must not be forgotten that a lunatic often makes elaborate preparations; there is, however, usually much general evidence in these cases. Besides, his object is to destroy himself as quickly and as surely as circumstances will permit; he is, therefore, not likely to adopt uncertain means for carrying this design into execution. Nevertheless we must not always expect to find suicidal wounds in what an anatomist would pronounce to be the most appropriate situation to produce instant destruction. A want of knowledge

or a want of resolution on the part of a suicide, or the accidental slipping of the hand, will often cause a wound in a part where we might least expect to find it.

Wounds which result from accident or suicide are generally in *exposed* parts of the body. An incised wound in a concealed or not easily accessible part is presumptive of homicide, because this kind of injury could have resulted only from the deliberate use of a weapon. Suicidal wounds are, however, sometimes found in the most unusual situations.

In November, 1903, an elderly woman was brought in dead to the London Hospital who, though right-handed, had with a razor in the left hand made a clean cut across the forearm just below the bend of the elbow, severing a sufficient number of bloodvessels to bleed to death; the evidence conclusively proved that this was a case of suicide; she was a woman who habitually had her sleeves rolled up to the elbows. Some years ago a young man committed suicide by dividing the arteries of the forearm on both sides.

It is rarely that we find suicidal stabs in the abdomen or throat, but an instance occurred a few years since in which a woman destroyed herself by a stab in the lower part of the abdomen; and several similar cases are recorded. In an attempt at suicide which fell under the author's observation, a stab was inflicted by a carving-knife on the fore part of the neck traversing the parts from the windpipe to the spinal column. In regard to situation, it has been remarked that there is no wound which a suicide is capable of inflicting upon himself which may not be produced by a murderer; but there are many wounds inflicted by a murderer which, from their situation and other circumstances, a suicide would be incapable of producing on his own person. We cannot always obtain certainty in a question of this kind; the facts will often allow us to speak only with different degrees of probability. A remarkable instance of the singular situation selected for suicidal wounds is reported in the *Med. Gaz.*, vol. 45, p. 439.

The situation of a wound sometimes serves to show whether it is of an *accidental* nature or not—a point often insisted on in the defence. Accidental wounds generally exist on those parts of the body which are exposed. Some wounds, however, forbid the supposition of accident even when exposed, as deeply incised wounds of the throat and gunshot wounds of the mouth and temples. For the report of a case in which an accidental wound on the head by an axe closely simulated a homicidal wound see Casper's *Wochenschrift*, May 24th, 1845.

5. **Evidence from the Nature and Extent of a Wound.**—Generally speaking, the wound met with on the body of a suicide, when firearms have not been used, is either incised or punctured, *i.e.* a cut or a stab. Contused wounds are rarely seen in cases of suicide, because in producing them there is not that certainty of speedily destroying life to which a self-murderer commonly looks. There are of course exceptions to this remark, as where, for instance, a man precipitates himself from a considerable height, and is wounded by the fall. Circumstantial evidence will, however, rarely fail to clear up a case of this description. Greater difficulty may exist when life is destroyed by a contused wound voluntarily inflicted.

A case is related in which a man first attempted to destroy himself by running with his head against a wall; and not having succeeded in the attempt, he struck himself repeatedly on the forehead with a cleaver. By this he produced such violent injury to the brain, that death soon followed. The man was seen to commit the act by several witnesses. Had not this been the case, the nature of the wound was such as to excite suspicion that it had been inflicted by another, and that the man had been murdered.

A close attention to the *shape* of wounds in the throat made by cutting instruments will sometimes lead to the development of cases rendered doubtful from the circumstances under which the dead body of a wounded person is found.

The body of a farmer was found lying on a high-road. His throat was severely cut, and he had evidently died from the bleeding which had taken place. A bloody knife was discovered at some distance from the body, and this, together with the circumstance of the pockets of the deceased having been rifled, led to a suspicion of murder. The suspicion was confirmed when the wound in the throat was examined by a surgeon. It was cut, not, as is usual in suicides, by carrying the cutting instrument from before backwards, but as the throats of sheep are cut when slaughtered by a butcher. The knife had been passed in deeply under and below the ear, and had been brought out by a semicircular sweep in front, all the great vessels of the neck, with the gullet and windpipe, having been divided from behind forwards. The nature of this wound rendered it at once improbable that it could have been self-inflicted, and it further served to detect the murderer, who was soon afterwards discovered. The prisoner, who had been a butcher, was subsequently tried and executed for the crime.

In *Reg.* v. *Cogan* (C. C. C., September, 1861), a case in which a man was charged with the murder of his wife by cutting her throat, the wound was eight inches long. It commenced at the centre of the back of the neck on the right side, passed downwards and forwards on this side of the neck across the throat to the middle of the left collar-bone. It was a very deep wound; it divided the windpipe, all the principal arteries of the neck, as well as the muscles, and ever went into the cervical vertebræ. The deceased probably did not move after receiving it. A bloody razor was found six feet from the body, and there was a pool of blood near this spot, while there were marks on the window-shutter produced by the spirting of blood from the bloodvessels in the position in which deceased's body was lying. There were fresh cuts upon the left hand of the deceased, such as would be caused by her grasping some sharp instrument.

The medical witness would not say it was impossible, but he thought it highly improbable that deceased could have produced this wound on herself. The prisoner, who had a slight wound in his throat, stated that this had been caused by his wife, who had afterwards destroyed herself. It was proved, however, that no blood had been effused at the spot where he said this wound had been inflicted by her. He was convicted. Such a wound as this could have been produced, if at all, only by the left hand of the deceased; its situation, direction, and extent, were more consistent with homicide than suicide, and the latter appears to have been clearly negatived by the facts—(1) that the deceased had bled in two places, while death must have been almost instantaneous; (2) that the weapon was found at a distance from the body; and (3) that the left hand of deceased was much cut, which could be explained only by the theory that she had endeavoured to protect her throat when attacked.

In the museum of the Sussex County Hospital at Brighton is a "detached portion of a windpipe consisting of parts of the cricoid, thyroid, and arytenoid cartilages, with complete circumference of the tube." This was cut out of a woman's throat by an undoubted act of suicide. Dr. F. A. Humphry, who communicated the case to the editor, was himself the medical witness in the case;

and he listened to the evidence at the inquest, which proved conclusively that it was suicide. Dr. Humphry found the victim "on her back quite dead with a razor and the piece of trachea by her side."

When persons labouring under insanity commit suicide, they often inflict upon themselves wounds of an extraordinary kind, such as would, at first view, lead to a suspicion that they had been produced by the hand of a murderer; and, therefore, the rules which are here laid down to distinguish homicidal from suicidal wounds must be guardedly applied to the cases of those persons who are known to have been insane.

In 1850, a case occurred at Guy's Hospital in which a person in a fit of delirium tore away the whole of the abdominal muscles from the lower and fore part of the abdomen. Had the body of this person been found dead with such an unusual and serious personal injury, it is not improbable that it might have been pronounced homicidal, and not suicidal. A woman suffering from delirium tremens tore open her abdomen with her hands. The wound produced was eight inches long, and about eight feet of the small intestines protruded from it as well as a portion of the large intestines, which had been completely torn across. She lived twenty-seven hours after inflicting this injury (*Lancet*, 1870, 1, 863). Such severe injuries as these, if found on a dead body, would perhaps not be described as self-inflicted, but as indicative of murderous violence. A pregnant woman under a delusion so ripped open her abdomen that a large wound was made, and the omentum and gravid uterus protruded (*Lancet*, 1870, 2, 258). A gentleman was found lying in a state of insensibility in the kitchen of his house, with a cleaver by his side. On examining the head upwards of thirty wounds were found over the back part of the skull. The wounds, many of which were superficial, had a horizontal direction from behind forwards. One, however, had removed a portion of the skull from the middle of the lambdoidal suture, so that some of the brain had escaped. This lunatic person died four days afterwards, but recovered so far as to admit that he had produced the wounds on himself, of which, from other circumstances, there could have been no doubt.

This was a most unusual way of committing suicide. Had the deceased been found thus wounded dead on a highway, the probability is that a strong suspicion of murder would have arisen. A case of this kind should be borne in mind when we are called upon to speak to the possibility of certain wounds found on a dead body having been self-inflicted (*Med. Gaz.*, vol. 24, p. 276). Ryan met with a case in which a man contrived to cut his throat exactly between the hyoid bone and the larynx, having previously made two distinct cuts of the thyroid cartilage. The wound was of an unusual kind, reaching backwards through the pharynx to the spinal column. There were two cuts on the fourth cervical vertebra and another on the inter-vertebral cartilage. The carotids and jugulars had escaped, but some of the larger branches of these vessels were divided. The man survived about seven hours (*Med. Times*, 1852, 1, p. 73; also *Lancet*, June, 1844. For another case of extensive wounds in the throat by a lunatic see *Med. Times and Gaz.*, 1853, 2, p. 219).

Wounds of the throat, when inflicted by suicides, are commonly at the upper part, involving the hyoid bone and the thyroid or cricoid cartilages; the large vessels often escape, but the larynx is opened. The wound does not always cause death by hæmorrhage. A woman, æt. 68, attempted suicide by inflicting a wound on her throat. It was between four and five inches long, and extended nearly from ear to ear. It had laid open the larynx between the hyoid bone and thyroid cartilage, and had taken off a portion of the epiglottis. There was no

arterial hæmorrhage, only a few veins having been divided. The patient did well at first, but inflammation of the lungs set in, and this carried her off on the sixth day. This was a secondary cause of death (*Edin. Month. Jour.*, February, 1863, p. 759).

The *extent* of a wound, by which we are to understand the number and importance of the parts injured, must in these cases be always taken into consideration. It has been somewhat hastily laid down as a rule that an extensive wound of the throat, involving all the vessels and soft parts of the neck to the spine, could not be inflicted by a suicide. Although in general suicidal wounds of this part of the body do not reach far back, or involve the vessels of more than one side, yet we find occasionally that all the soft parts are thus completely divided. These are cases in which, perhaps, with a firm hand, there is a most determined purpose of self-destruction. In a case of suicide observed by Marc, the weapon had divided all the muscles of the neck, the windpipe, and gullet; had opened the jugular veins and both carotid arteries; and had even grazed the anterior ligaments of the spine. A wound so extensive as this is rarely seen in a case of suicide; but there is no ground for the assertion that extensive wounds in the throat are incompatible with self-destruction.

In a case of suicide (witnessed by three fellow-workmen) in 1893 there had been one tentative cut on left, just incising the skin, and the fatal wound was very deep. It had divided both sternomastoids, the left common carotid and internal jugular, cleanly severed the upper part of thyroid cartilage above false vocal cords, passed through base of arytenoids, cleanly divided œsophagus, cut through longus colli on left side, and notched intervertebral disc. On the right it had opened carotid sheath, but left vessels intact.

Incised wounds in the throat are generally set down as presumptive of suicide; but murderers sometimes wound this part for the more effectual concealment of crime. Circumstances connected with the form and direction of a wound may in such cases lead to detection; for, unless the person attacked be asleep or intoxicated, resistance may be offered, evidence of which may be obtained by the presence of great irregularity in the wound or the marks of other wounds on the hands and on the person of the deceased. In some instances, however, it is extremely difficult to say whether the wound is homicidal or suicidal, the medical facts being equally explicable on either hypothesis. *Regularity* in a wound of the throat has been considered to be presumptive of suicide. This was the publicly expressed opinion of Sir Everard Home in the well-known case of Sellis. The deceased was found lying on a bed with his throat extensively cut, and the edges of the incision were regular and even. It was inferred that this condition of the wound repudiated the idea of homicide; but as a general principle this appears to be a fallacious criterion. A murderer by surprising his victim from behind; by having others at hand to assist him; or by directing his attack against one who is asleep, intoxicated, or from age or infirmity incapable of offering resistance, may easily produce a regular and clean incision of the throat.

In November, 1903, a woman was brought into the London Hospital with her throat cut. The murderess was convicted (C. C. C., December, 1903). The edge of the wound in the throat was as straight and clean cut as though done for purpose of illustrating how straight a cut could be made.

Some have taken a contrary view to that of Home, and have contended that the chief character of a suicidal wound in the throat is great irregularity from want of steadiness in the hand during the perpetration of suicide. It is by no means unusual in suicides to find the cut regular at its commencement, and irregular or uneven at its termination, from the loss of blood which attends the first incision; but it is obvious that a homicidal wound might possess these characters. In short, we are entitled to say, regularity or irregularity in an incision in the throat furnishes no presumptive evidence either of homicide or suicide.

The nature and extent of a wound, or of other injuries on the person, will sometimes allow us to distinguish *accident from homicide*. These personal injuries may be such that they could not possibly have had a suicidal or accidental origin. In a case that occurred at Manchester in 1836, it was shown that seven ribs were fractured on one side of the chest of the deceased, and five on the other. The person charged with murder alleged in defence that he had merely struck the deceased a slight blow, and that the ribs were subsequently broken by an accidental fall. The medical witness, however, satisfied the court that the fall, as described by the prisoner, was inadequate to the production of such extensive violence; and that, even had the deceased fallen on *one* side, this would not account for the fracture of the ribs on the *other*. When, therefore, we find in a dead body severe injuries referred to a fall, we should search the whole of the body carefully for proofs of violence. The insides of the arms or thighs may present marks of injury which could not possibly be explained on the supposition of an accidental fall. Severe contusions on both sides of the body, or anteriorly and posteriorly, commonly indicate homicidal violence. The body of a woman alleged to have been murdered by her husband presented numerous marks of contusions, and one arm was completely ecchymosed from the shoulder to the hand. The person charged with the murder ascribed these appearances to the fact of his wife having accidentally fallen out of bed; but on examining the bed it was found to be only a foot from the floor. A fall from this height would not account for the presence of such extensive marks of violence; but, irrespective of this, a severe contusion was found on the outer side of the opposite thigh, which, from the appearance, must have been produced about the same time as that on the arm. The existence of this second contusion rendered the defence still less probable; for the woman could not, if she had fallen at all, have fallen on both sides of her body at once, and it was not alleged that she had had more than one fall.

The depth to which a suicide can cut his own throat is often a matter of wonder; but there are limits to it, of which the following is an example (*Reg.* v. *Edmunds*, Swansea Lent Ass., 1863):—

A young woman, named Jane Lewis, was found dead with her throat cut lying in a pathway not far from the house in which she resided as servant, and a razor taken from the house was lying near the body. She had left home perfectly well about seven hours previously to keep an appointment with the man who was charged with the murder. This man was a fellow-servant, to whom she was about to be married. There were three distinct and deeply incised wounds in the neck made from left to right, the upper one, four inches in length, commencing below the left ear, and running parallel to the jawbone; the middle cut, about seven

inches in length, commencing at the same point, and running across the middle of the neck to a spot behind and below the right ear; and the lower cut, six inches in length, commencing above the middle of the left collar-bone, going in a perpendicular direction, and terminating in the front of the neck by joining the middle incision. The middle cut divided the windpipe, the gullet, and all the great vessels and nerves in front of the neck to the cervical vertebra. There were two distinct cuts into the spinal column about the third cervical vertebra, one penetrating deeply into the upper edge of the bone, and the other, a quarter of an inch below it, commencing on the body of the vertebra and running more deeply to the right side. This divided the transverse process of the vertebra, opened the joint between it and the bone, and severed the vertebral artery. There were deep cuts, which had bled, on the inside and outside of the left hand; and the pad of the middle finger of the right hand had been sliced off, and was found wedged in the joint of the razor. This was half open, and lay a yard behind the body. There was no blood upon the handle, while the hands of the deceased were bloody. The deceased's bonnet was found, covering a large patch of blood near the razor. A collar which she wore, as well as the strings of her bonnet, had been cut through, and these, like the razor, were at a distance from the body.

It is scarcely necessary to adduce reasons for showing that these wounds could not have been inflicted by the deceased upon herself. Apart from all the surrounding circumstances, and looking at the medical description only of the situation, nature, extent, and direction, the surgeon was quite justified in saying that "it was impossible for any person to inflict such wounds upon himself." The hacking of the bones of the spinal column in *two distinct places* with such force as to cut off a part of the bone, after both carotid arteries and jugular veins had been cut through, was alone sufficient to justify this opinion. In order to produce these marks, the razor must have been obviously twice used with great force through the same deep incision. There could be no reasonable doubt that this was an act of deliberate murder; but there was a failure of proof to trace it to the accused. Suicides may graze the ligaments in front of the spinal column; but that they should make deep incisions into the bones, cut off hard bony processes, and divide the intervertebral substance and the vertebral arteries, is a proposition contrary to all experience and probability.

At the Chester Assizes, before Mr. Justice Vaughan Williams, in June, 1894, Marg. Deakin was charged with the murder of Eliz. Heald. The medical evidence was so important, and the judge's criticisms so interesting, that they are worth quoting in full, as an object lesson to medical jurists. The defence suggested that the case was one of suicide, and not homicide. Verdict "Guilty."

Dr. W. Horton Smith (Northwich) said he was called to the scene of the tragedy on 26th January, and found the body of the deceased. She had been dead at least eight hours. The left arm lay across the chest, the hand holding a large knife loosely. There was a wound in the neck reaching almost from ear to ear, six inches in length, and the result of two incisions. One incision had first been made on the left side, and the knife had been introduced into the wound again, almost to the bottom of the first incision, and another incision had then been made, passing almost directly upwards to the back of the mouth. The wound was evidently made from left to right. There were indications of other attempts on the throat. On the thumb of the left hand there was a slight wound, a very deep wound between the thumb and first finger. There were other cuts on the left and right hands. The throat wounds could not have been self-inflicted. If they had been, he would have expected to find the knife firmly gripped in the right hand, and the wounds transverse, and not tending upwards.

Cross-examined: He did not remember saying at the inquest that it was

conceivable the wounds might have been self-inflicted. When confronted with his written evidence, the witness admitted his signature, but he could not remember making that statement. It was a fact that suicidal wounds varied more than any others. Whichever of the throat wounds was first inflicted, unconsciousness would have supervened, and it would have been impossible to inflict a second.

Dr. Marsh (Northwich) deposed to making a post-mortem examination of the body. The wounds on the throat had been made by two distinct incisions. The first divided all the structures down to the bone, and cut a groove in the bone. The second went in a higher direction, and divided the deep structures up to the root of the tongue. The reason why he said there had been two incisions was that the main artery on the left side had been divided twice. The first incision, which was the lowest, cut the main artery across; the second incision, which was higher, cut the artery across, giving ocular demonstration of two incisions.

His Lordship: We all agree there were two incisions. The point is, why do you speak on one incision as being prior in time to the other? How do you ascertain which incision was the earlier?—Witness: The first incision, which is the lowest of the two, cut through the skin and the windpipe and the gullet. Having been cut through, they would retract, be drawn downwards and upwards, so that these structures were not divided by the second incision. The second incision missed them. There was nothing divided twice but the artery. The division of the windpipe being in a line with the lowest of the two incisions, and with the groove in the bone, it necessarily follows that the other incision must have been second to it, otherwise the windpipe must have been divided higher. It is impossible for the wounds in the neck to have been self-inflicted.

Cross-examined by Mr. Trevor Lloyd: When before the coroner, did you say, "I think it is exceedingly probable that both wounds could have been self-inflicted; I cannot say that they have not been self-inflicted"?—Witness: Yes, but that is not quite the same thing.

You did not say it was impossible?—I said it was exceedingly improbable.

But you said, "I cannot say they have not been self-inflicted"?—No, I can only say it is improbable.

His Lordship: But to-day you said "impossible," and you understand "impossible" and "improbable" are not quite the same thing. Is "improbable" right and "impossible" wrong, or *vice versâ*?—Impossible, considering the two wounds.

Why did you say "improbable" only before the coroner?—We were mixed up between one and two wounds. The fact was not clearly brought forward that there were two wounds.

Then with regard to one wound you say it is improbable, but possible, that one wound was self-inflicted?—Yes, but I said both wounds to-day.

By Mr. Lloyd: I admit the first wound might have been self-inflicted.

Frank Thomas Paul, Fellow of the Royal College of Surgeons, surgeon to the Liverpool Royal Infirmary, and Professor of Medical Jurisprudence at Victoria University, was examined at some length. The throat wounds, he declared, were certainly not self-inflicted. Either of them would have been rapidly fatal. Many of the deep tissues were divided into two parts. That was quite sufficient to decide that the wounds were made in two cuts. In witness's opinion neither of the wounds was self-inflicted. Speaking of the lower cut by itself, if that had been the only cut (which was against reservation), his reasons for saying that such a cut was homicidal rather than suicidal were—(1) the size of the wound, and (2) that the deep tissues were cut further than the skin. These reasons were applicable only to the hypothesis of only one cut on the neck, and without regard to the other wounds on the hands, etc.

His Lordship: How a wound on the hands can affect the view regarding a wound on the neck passes my comprehension.—Witness: All authorities on medical jurisprudence consider them of the utmost importance. We cannot judge a single cut by itself. Medical men, any more than courts, don't come to a conclusion on one point alone. Here is a wound which might have been either homicidal or suicidal if you take one alone.

His Lordship: Really I must ask you to bear in mind you have nothing to do with the termination issue of this case. You come here to give scientific evidence, and if a hypothesis is placed before you, you must answer on that hypothesis.

Witness: I was trying to answer in such a way as not to mislead you.

Examination continued: Witness said it was, in his opinion, impossible for a

suicide to inflict the second wound, which was an upper cut, because the second wound commenced in the first cut. The effect of the first cut upon the victim would render her almost immediately unconscious. The wound was so deep upwards as to be almost unknown in cases of suicide. Witness never heard of a wound being in an upward direction in throat wounds of this kind. The throat wounds were unquestionably from left to right. Such a wound, if suicidal, must be cut with the right hand. In suicide, the knife was tightly grasped after death, the grasp being a species of rigor mortis, which would last till decomposition commenced, say, two days in the month of January. It varied according to the weather. The other small cuts and scorings on the neck were quite different from the tentative wounds caused by a suicide in making up his mind to cut his throat. They rather resembled the wounds made when the assailed was trying to escape the assailant's knife. The cuts on the hands showed several attempts to grasp the blade of the knife.

Cross-examined: Suicidal wounds varied more than any other in direction and extent. It was not a fact that a maniac would often cut upwards, but it was stated in some books that maniacs might cut upwards. It was always regarded as a sign of homicide when the wounds were upwards. A maniac would cut in almost any direction. It was a fact that a suicide sometimes dropped his weapon; he either gripped or dropped it.

By the Judge: Supposing prisoner had inflicted the wounds, considering the fact that deceased was almost lying on the ground, prisoner must have stooped or knelt down in order to use the knife. The assailant must have been more or less recumbent, judging from the blood splashes on the wall.

Medical evidence regarding the nature, probable origin, and date of any wounds found on a child who may be unwilling or unable to give evidence may be of the utmost importance in deciding the question "Accident or Intent?" For instance, in the trial of Mrs. Penruddocke at the Old Bailey in 1903 it was on the medical evidence that the prosecution mainly relied. It was so also in that of Mrs. Day at the Exeter Assizes, October, 1903, when Dr. W. A. Valentine, of Appledore, called on behalf of the prosecution, said that he had examined the child Joan Day on two occasions, the first being August 4th, a week before her removal from her mother. She then appeared to be frightened. He found marks upon her hands and arms consistent with her story that her mother had cut her arms, had scratched her hands, and had bitten one of her fingers, also marks consistent with her story that her hand had been burnt by her mother. There were twelve marks on her right hand and arm and eleven on the left, a condition which in itself could hardly be accounted for by the explanation of the defence that she was a clumsy child and given to hurting herself accidentally (*Lancet*, 2, 1903, p. 1254).

6. **Evidence from the Direction of a Wound.**—The direction of a wound has been considered to afford presumptive evidence sufficiently strong to guide a medical jurist in this inquiry. It has been remarked that in most suicidal wounds which affect the throat the direction of the cut is commonly from left to right, either transversely or more often passing obliquely from above downwards; in suicidal stabs and punctured wounds, the direction is commonly from right to left, and from above downwards. In left-handed persons the direction would, of course, be in the opposite transverse directions. Suicidal wounds are, however, subject to such variation in extent and direction, that it is scarcely possible to generalise with respect to them. Nevertheless an attention to these points may sometimes be of real assistance to the inquirer, especially when the body has not been moved from its position. It is obvious that, if a murderer makes an incised wound in

the front of the throat from behind, the direction may be the same as that commonly observed in cases of suicide. (See on this point the case of *Reg.* v. *Dalmas*, C. C. C., May, 1844.) Again, if the person attacked is powerless, the wound may be deliberately made so as to simulate a suicidal act; indeed, a murderer might attack the throat with the design of simulating an act of suicide. A homicidal stab may also take the same direction as one which is suicidal, but this would be confined to those cases in which the assailant was placed behind or aside. If in front of the person whom he attacks, the direction would probably be from left to right; but in suicide, when the right hand is commonly used, it is the reverse. Oblique wounds passing from above downwards are common to homicide and suicide, but those which take an oblique course from below upwards are generally indicative of homicide, for it is extremely rare that a person bent on suicide, unless a lunatic, thus uses a weapon. Homicidal incisions, especially in the throat, are often prolonged below and behind the skin forming the angles of a wound (undercut is the common term) deeply into the soft parts. Those which are suicidal rarely possess this character; they terminate gradually in a sharp angle, and the skin itself is the furthest point wounded. The weapon is not carried either behind, below, or beneath it. Exceptions to these characters may exist; but in a dark and intricate subject of this nature we have only these limited rules to guide us. The instrument with which a wound is supposed to have been inflicted should be adapted to the edges of the incision, its sharpness compared with the cleanness and evenness of the cut, and its length with the depth of the incision or stab. It is no uncommon occurrence for a murderer to substitute some instrument belonging to the deceased or another person for that which he has actually employed; and this by its size, shape, bluntness, or other peculiarities, may not account for the appearances presented by the wound.

The *end* of an incised wound in the throat is often digitated, owing to the skin being dragged forward in folds by the cutting instrument; and when recent the minute saw-like serrations of the skin point towards the commencement of the wound. (See Plates VI. and VII., Ogston's "Lect. on Med. Jurispr.")

The editor has had a fairly large experience of cut throats of a known denomination (suicidal or homicidal) in the last twenty years at the London Hospital, and he is convinced, from this experience of the known, that in an unknown case all the criteria derived from depth and direction only—*i.e.*, apart from other evidence—would fail in positively fixing the denomination of the case, though in some cases probability may be arrived at. In this view Dr. Littlejohn concurs (*B. M. J.*, September 24th, 1904).

If, by examining the ends of a wound (undercut or jagged at one end, and that the terminal end), it becomes possible to decide whether it was inflicted from right to left, or *vice versâ*, it is then sometimes possible to say which hand was used by a suicide, or, if the relative position of the parties is known, by a murderer, a point which may have an important bearing, if either of them be known to be only right or left-handed. It is necessary, however, for a medical jurist to be aware that there are many persons who are *ambidextrous*, *i.e.*, who

have equal facility in the use of the right and of the left hand. This may not be generally known to the friends of the deceased; and such persons are often pronounced, even by those who had associated with them, to have been right-handed. A want of attention to this point is said to have been one of the circumstances which led to a suspicion of murder in the case of Sellis (Wills's "Circ. Evidence," p. 97).

This man was found dead on his bed with his throat cut, the razor being on the left side of the bed, whereas it was generally supposed and asserted that he was a right-handed man. The truth was, he was equally expert in the use of the razor with his left and with his right hand; and thus the suspicious circumstance of the razor being found on his left side was at once explained away. In 1865, a case of suicide by cut throat occurred in London which shows the necessity of caution in forming an opinion in these cases. A man, known to be right-handed, was found dead with his throat cut; it proved to be what is called a "left-handed cut," *i.e.*, done with the left hand.

It appeared in evidence that deceased was brought up as a wood-carver, a trade which requires a man to use both hands equally well. Thus the cause of the wound being in an unusual direction for a right-handed man was satisfactorily explained. The direction in which a wound has been made may not infrequently be determined by the serrated character of the edges. The points of these serrations are directed towards the commencement of the wound. If, after the wounding, the person lives more than two or three days, these serrations disappear by the absorption going on in the edges of the wound. In cases of cut throat the existence of small tentative cuts near the commencement of the main cut affords aid in diagnosis. If these are fairly parallel with the chief wound, the presumption afforded by this evidence is that the wounds are suicidal; but if the tentative wounds be different in direction from the principal wound, this points rather to homicide than suicide, and may be referred to the attempts by struggling to evade the assassin's knife.

However indecisive the indications may be from the direction of incised wounds, those from the direction of stabs give precise information as to the position of the weapon at the time the wound was made, and therefore of the position of the assailant's arm; and still further deductions may often be drawn as to the relative positions of the parties, points which may be of no absolute and positive value in themselves, but are very important in corroboration or contradiction of the accused's tale of how things happened (*vide* "Evidence of Prisoner in the Box").

At the trial of a Mrs. Mackinnon for murder (1823) a careful observation of the direction of a stab in the chest clearly proved the falsehood of a defence. The deceased had been stabbed with a knife, and on an inspection of the body it was found that the wound, which was situated over the cartilage of the second left rib, penetrated towards the left, backwards, and very much downwards, into the lungs. On the part of the prosecution it was alleged that the prisoner held a long table-knife daggerwise, and struck the deceased in a direction downwards, forwards, and to her right side. The prisoner alleged in defence that she merely held the knife before her, sloping upwards to deter the deceased from attacking her; that he stumbled forward and fell upon the point of the knife. This statement was in some measure confirmed by the bystanders. As the witnesses on both sides were intoxicated, the important medical fact to guide the jury was the *direction* of the wound. This was wholly inconsistent with the statement of the prisoner, but in accordance with the evidence for the prosecution (*Edin. Month. Jour.*, November, 1851, p. 418).

Foreign tribunals in questions of this nature have taken evidence on the stature

of the assailant and deceased as an aid to solve the question whether a stab was the result of accident or homicide. A trial took place in Rome (case of De Lucca, Rome, April, 1872) in which during a quarrel between the Pope's guards and some soldiers one of the former fell dead from a bayonet wound in his side between the sixth and seventh ribs. The medical evidence showed that the wound took a horizontal direction and caused death by dividing the vena cava. The medical witnesses called for the prosecution deposed that the deceased De Lucca was more than six feet, while the person alleged to have inflicted the stab was under five feet, in height. On this ground they alleged that if wilfully inflicted a bayonet thrust from so short a man as the prisoner must have taken a decidedly upward direction instead of a horizontal one. They seem to have forgotten that by raising his musket with both hands the prisoner might have inflicted a stab taking either a horizontal or even downward direction in spite of the difference of stature. The evidence rendered it probable that the deceased, in attempting to wrest the musket from the prisoner, accidentally drew it towards him and inflicted the bayonet wound on himself. The prisoner was acquitted. It may be here observed that accidental stabs when persons are standing upright are commonly horizontal. Watson describes the case of a man who while performing in "Rob Roy," and when the stage was obscured by smoke, accidentally ran forward upon the bayonet of one of the soldiers and thus received a horizontal stab in the chest, from which he died in a few seconds ("On Homicide," p. 276). In 1858 an inquest was held on the body of a man who had died from an accidental stab under the following circumstances: —Lieutenant Clavering and a friend were walking late at night near Acton, when they were attacked by the deceased, who was intoxicated. In self-defence Clavering raised a sword-stick which he carried; the deceased pulled at it, and thus unsheathed it, the lieutenant keeping the sword pointed outwards. The deceased fell, but it was not known at the time that he had been stabbed, as he was helplessly intoxicated. At the first place where there was a light on the road the lieutenant and his friend examined the sword, and they saw no blood upon it. The drunken man was picked up dead, and on examination it was found that he had died from a penetrating wound in the chest, involving the heart. It commenced on the outer side of the right nipple, was seven or eight inches long, going straight across the chest to the heart. It must have been given or received when the deceased was standing sideways. The medical witness properly admitted that this direction was quite consistent with accident and with the mode in which the lieutenant and his friend had stated that the wound had been inflicted. The only unintelligible part of the case is that the lieutenant, holding a sword point outwards, should not have been aware, either by its entrance or withdrawal, that it had penetrated a human body when the circumstances were such as to render such an accident highly probable.

In *Reg.* v. *Carver* (Guildford Aut. Ass., 1870) the prisoner was charged with the murder of his wife by stabbing her in the chest with a knife. The wound was between the fourth and fifth ribs of the left side. It was four inches deep, and had penetrated to the heart. It caused death in two or three minutes. The defence was that the deceased rushed at the prisoner while he was holding the knife in his hand. The direction of the wound was described as straight or transverse, and the surgeon thought it might have been caused by the woman rushing on the knife in the manner described. As to the precise direction of the wound, the witness said it was rather upwards towards the heart. There were other marks of violence about the deceased, showing that she had been ill-treated, and there was evidence of the prisoner having been seen to strike her about the time at which she was wounded. Upon this evidence he was convicted.

A remarkable case, involving a similar question, was tried at the Central Criminal Court (*Reg.* v. *Davy*, July, 1871). The prisoner was charged with the manslaughter of Mr. Moon under the following circumstances:—A fall was heard in the dining-room, and on persons going in they found the deceased on the floor dying from a wound in his chest. The prisoner said in answer to an inquiry: "I am afraid I did it, but I don't know how; it must have been done in the scuffle." A large table-knife, taken from the knife-box on the sideboard, had been removed from the wound, and was lying within the fender. There was evidence of threats and quarrelling between the parties, but the defence at the trial turned mainly on this medical question: "Was the wound such as might have resulted from accident during a scuffle, or did it carry with it clear and undoubted proofs of design?" The wound penetrated the left side of the chest between the sixth and seventh ribs,

reaching and wounding the apex of the heart, and was downwards, forwards, and inwards in one uniform direction, straight from end to end, never changing its course. The obliquity of the ribs allowed of its reaching the apex of the heart There was not the slightest upward tendency in the direction of the wound. The opinion of Savory was "that the wound must have been inflicted by another person stabbing the deceased, and that it was caused by one blow given with considerable force." He could not suggest any theory satisfactory to himself by which the wound could have been caused accidentally. Other surgeons gave evidence to the same effect.

The engraving (fig. 24, below), reduced from a photograph, shows where the knife entered between the ribs and the direction which it took from the lower margin of the sixth rib at the side to the lower margin of the seventh rib in front. The wound in the skin, which is here removed, was about two inches further back. Its exact situation is indicated by a pin projecting from the under-edge of the sixth rib.

Fig. 24.



Side view of the ribs, showing the direction of a stab traversing the heart (*Reg.* v. *Davy*).

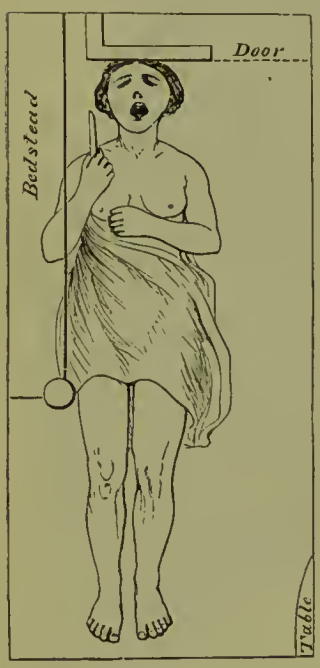
The counsel who defended the prisoner made the suggestion that "two medical men might come to different conclusions as to the *course* such a wound took." Savory believed it was impossible that the body of Moon had fallen on the knife and so inflicted the wound. He could not account for the wound in that way. He would not swear unconditionally that it was impossible, because his judgment might err, but he believed it to be impossible, and he said, the wound being from above downwards, the pressure must have come from above, whereas in the case of a falling body the pressure would come from below. For the defence four surgeons were called, who thought the wound might have been caused by the deceased in pulling down the knife upon himself during a struggle with the prisoner. One believed that the knife might have been driven into the apex of the heart by a fall. An appeal to the jury to acquit the prisoner on the ground of the conflicting opinions expressed in the case and the difficulty which the jury must necessarily experience in seeing their way to a verdict of guilty failed. There is every reason to think that the view of this case expressed by Savory—namely, that this wound, from its situation, direction, and depth, was the result of an act of deliberate stabbing, and that no accident could reasonably explain it—is a correct one.

In *Reg.* v. *Malony* (C. C. C., September, 1861), in which a man was convicted of the murder of his wife by stabbing her in the neck, the direction of the wound was not consistent with the testimony of a witness upon whose evidence the case chiefly rested. The medical witness stated that the stab followed the line of the axis of the shoulder, commencing above the collar-bone on the left side, and passed perpendicularly downwards into the chest. It caused almost immediate death. The prisoner stated that his wife had inflicted the wound on herself and had then thrown the knife away. (It was found sticking by the blade, upright in the floor.) There was blood upon the hands of the prisoner and upon his clothes. The medical witness admitted it was possible that the deceased might have produced this wound on herself, and, in answer to a question by the judge (Byles, J.), he thought it

probable. At the trial a witness came forward and swore that he saw the prisoner stab the woman, but he gave no information to the police nor said anything about the matter. He was asked what sort of stab it was that he saw the man give to the woman. "The witness made a *forward thrust* with his right arm," but a wound such as that described by the surgeon could have been produced only by a downward thrust, the hand and arm being considerably raised. The medical witness was not further examined on this point, and on the direct testimony the prisoner was convicted of murder. It is a new feature in cases of this kind to have the question of *probability* introduced. When a medical witness has admitted that the wound may have been self-inflicted he has gone as far as professional knowledge will admit. The question of probability must be solved, if at all, by the other circumstances of the case.

A few years ago at Douglas, Isle of Man, a man was put on his trial for murdering his wife. Medical evidence proved that the fatal wound had penetrated the left side of the chest close to the sternum in the third intercostal space. Close to the sternum the wound was deep, and had cut the pulmonary artery. Further away the wound became shallower, ending as a mere skin incision. The prisoner alleged that he was cutting his nails with a sharp penknife (the admitted weapon), and that, as his wife aggravated him, he had pushed her away with his hand containing the knife and brought his hand round in a sweep. The wound precisely corresponded with such an explanation, and led to the acquittal of the prisoner.

Fig. 25.



Position of the body of Mrs. Gardner (*Reg.* v. *Gardner*, C. C. C., 1862).

7. **Evidence from a Multiplicity of Wounds.**—It is obvious that much will here depend upon the nature of the multiple wounds and their situation. For instance, wounds found on the hands in conjunction with a fatal cut in the throat or a stab are almost proof positive of homicide, the hands being wounded in attempts at defence. Again, a murderer in the blind rage of passion may inflict wantonly several severe wounds, and suicides may make several attempts at self-destruction.

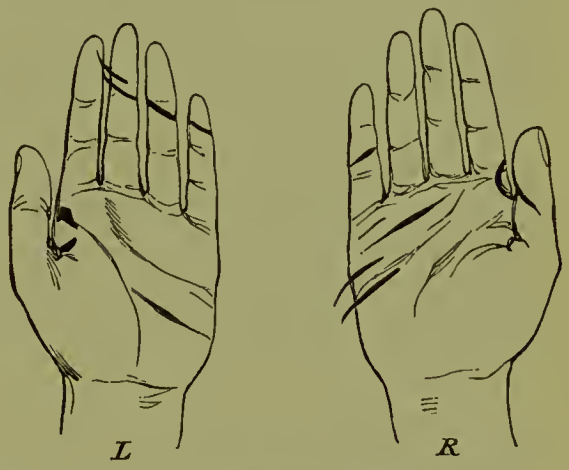
Cuts in the hands were very material evidence in *Reg.* v. *Gardner* (C. C. C., 1862). Among various medico-legal questions to which this case gave rise was that which we are now considering: Were the wounds in the throat inflicted by the deceased on herself, or by another person? Without going minutely into details, it may be stated that Sequeira, the surgeon who was called, found the woman dead, and blood was copiously effused, but only on each side of the neck, not in front of her person. A large table-knife was loosely placed in her right hand; it was lying in the direction of the length of the body, the back of the blade towards the chest, and the sharp edge in front. There was dry blood upon the blade and handle. The illustration (fig. 25, above), made from a drawing on the spot, shows the exact position in which the body was found on the floor of the room. It was lying at full length in a corner by an open door as if laid out, the right arm, which held the knife, being partly under a bed, as indicated by the line which traverses it. The wound in the throat cut through the bone and thyroid cartilage of the larynx, dividing the thyroideal artery, causing a flow of blood and death by suffocation. It commenced over the larynx as by a deep stab, and extended for about two inches downwards and backwards on the left side. It must have been inflicted while the deceased was lying down, and under the circumstances it was not such a wound, in the opinion of the medical men, as a woman could have inflicted on herself while in this position.

The knife was lying *loosely* in the right hand of deceased, and the small quantity of blood on the palms presented the appearance of smearing or wiping. On these

facts being proved, it became simply a question which of two persons then in the house was guilty of this act of murder. The husband was convicted of the crime. In homicidal wounds of the throat, the hands of the deceased, either back or front, frequently present marks of recent cuts. These injuries arise from an instinctive effort to protect the throat under a sudden attack. It need hardly be said that a person contemplating self-destruction by wounding the throat would not begin by making cuts across the hands. Sometimes the weapon may be so grasped by the person attacked as to cause numerous cuts on the front of the hand. These will, of course, bear the characters of recent cuts. Their presence should admit of some reasonable explanation. In the case of Gardner, below, this was one of those facts properly considered to be inconsistent with the innocence of the prisoner. The palms of the hands of the deceased presented numerous fresh cuts in the positions shown by the illustrations, fig. 26. The sharp blade of the knife had probably been grasped by deceased before her death in resisting the attack. There were four cuts on the left hand and six on the right. Some of the cuts were across the fingers. Of two on the middle finger of the left hand one had gone completely through to the bone.

In examining a dead body, attention should be paid to the state of the *mouth* and *throat*. Assailants who make their attack during sleep sometimes endeavour to close the mouth, or to compress the throat, so as to prevent an alarm being given. In the case of the Duchess de Praslin, there were the marks of finger-nails around the mouth. In another case, ecchymosed impressions, as if produced by a hand, were found upon the throat of the deceased. The *hands* of the dead person should always be examined; many cuts, excoriations, or incisions found upon them, especially if on the dorsal surfaces (backs), will indicate that there has been a mortal struggle with the assailant.

Fig. 26.



Case of Mrs. Gardner. The recent cuts on the palms of the two hands are here shown by the dark lines.

In suicides, commonly one wound only is seen—namely, that which has destroyed life—and the presence of several wounds on the body or the marks of several attempts around the principal wound have been considered to furnish presumptive evidence of murder. But any inferences of this kind must be cautiously drawn, since not only may a murderer destroy his victim by one wound, but a suicide may inflict many, or leave the marks of several attempts before he succeeds in his purpose.

A case is reported in which a man, labouring under mania, attempted to destroy himself. Besides many wounds on the forearm, neck, and face, which disfigured him, there were twenty-two in front of his chest. One of these had traversed the heart, producing death after some hours by causing effusion of blood (*Lancet*, 1839, 2, p. 605).

In wounds of the throat, owing either to ignorance of the situation of vital parts, or to tremulousness of the hand, a suicide often produces one or more incisions of greater or less extent near that which

has destroyed life. This is especially the case when the instrument happens to lodge in the first instance on the cartilages of the larynx. The same remark applies to suicidal stabs when the point of a weapon, in being directed against the chest, comes first in contact with the ribs or their cartilages. With respect to the throat, many cases might be cited in which two, three, and even six or more incisions have been made in this part by suicides before they have succeeded in destroying themselves.

A case occurred to Handyside (*Edin. Med. and Surg. Jour.*, January, 1838, p. 209) in which a medical man destroyed himself by inflicting several wounds on his throat. An incision was found on each side of the neck, just below tho anglo of the jaw, and in the hollow behind it. They were irregular in form, and bore the character of deep stabs. The only important vessel divided was the internal jugular vein on the right side; but nevertheless a large quantity of blood was lost, and this was no doubt the cause of death.

The case is in many points of view singular, for such wounds have perhaps never before been described in cases of suicide. It would appear that the deceased was ambidextrous, and that the wound on each side of the neck was inflicted by the hand of the opposite side. The following case occurred in London in 1839.

A lady, who had been for several days in a desponding state, was found one morning dead in her bed in a sitting posture. On examination, two very deep and extensive wounds, which had divided the principal blood-vessels, were perceived on the right side of the neck. There were two penknives on the bed covered with blood. From the situation and other characters of the wounds, it was inferred that they must have been inflicted with the left hand, although nothing satisfactory could be ascertained on this point. The husband and son slept in the adjoining room. There was no doubt that this was a case of suicide, although it is singular that two deep wounds should have been found thus inflicted by two different weapons on the right side of the neck, in the case of a person who was not known to be left-handed.

The *number* and *nature* of the wounds on these occasions generally lead to a strong suspicion of murder.

In 1859, a woman, æt. 60, was one morning found dead with severe wounds on the back and front of her neck, apparently made as if in an attempt at decapitation. She was seen alive three-quarters of an hour before, and the only person in the house was her husband, an aged, feeble man. A large table-knife newly sharpened was found near the body. When examined by Lucas, the following injuries were observed. In front there was an incised wound across the throat, four inches long, from about half an inch on the right side of the middle lino towards the left ear, dividing the large muscles on the left side of the neck, and the left internal jugular vein, which was gaping. The mark of the cutting instrument was very distinct on the cartilages of the neck, extending rather obliquely down from right to left. On the back of the neck there was a deep gaping wound, extending horizontally from the right ear to the angle of the jaw on the left side, passing down between the third and fourth vertebræ, laying the spinal marrow bare; there was a slight abrasion on the surface of the cord, which might have been accidentally produced during the examination. A second cut was found passing between the second and third vertebræ, also extending to the spinal cord. The skin showed marks of several incisions, the muscles being mangled by repeated cuttings; the edges of the bones were rough, and one slice of bone about the size of a shilling lay almost detached in the wound. The wound in front was separated from the one behind by about half an inch of skin. There were no marks of violence on the hands or on any other part of the body.

The evidence at the inquest proved that the son had left the house before the time of the woman's death, and that she had spoken to the

neighbours and her husband in a desponding manner a few days before the event. The evidence was generally in favour of the deed being suicidal. It was satisfactorily established that the husband and wife had lived on good terms, and no motive for his perpetrating such an act could be suggested. A verdict of "Wilful murder against some person unknown" was returned. These wounds might have been inflicted by the deceased on herself with her left hand, probably in her attempt to cut off her head. The wounds at the back of the neck were inflicted first, while the principal wound—that which proved fatal by the division of the jugular vein—was inflicted last. The woman had been for some time in a desponding state, and on the evening before the event she had been observed by her husband to pass a knife with her left hand across the back of her neck, as if she was contemplating suicide. There was not the slightest proof of homicide.

The *number*, *situation*, and *direction* of the wounds found on a dead body may be inconsistent with the theory of a suicidal origin.

A woman was found dead at New York in 1839, and there were many wounds upon her body. The husband was suspected of having killed his wife, but he asserted that she had destroyed herself. This defence, however, was shown to be inconsistent with the medical facts. Three physicians who examined the body deposed that there were eleven stabs, eight on and about the left side of the thorax, one of which had penetrated the pericardium, and divided the trunk of the pulmonary artery at its origin; and the others were on the back, near the left scapula.

It was considered to be quite impossible that these last-mentioned wounds could have been produced by the deceased, and there was every reason to suppose that the stabs in front and at the back had been inflicted at the same time by an assassin. In acts of murder perpetrated by lunatics or persons labouring under delirium tremens, it is usual to find a large number of wounds on the body of the person attacked.

In a case at York, in 1871, a man in a fit of delirium tremens killed his wife by cutting and stabbing her. Proctor found on the body of the deceased fifty-six wounds, of which some were of a nature inconsistent with the theory of self-infliction.

The object with such criminals is apparently not merely to kill, but to mangle the body of the victim.

Dr. Nelson Hardy reports the following case of two cuts in the throat:—

In June, 1886, I was taken to a room in an unfinished house, which had not been entered for some weeks as far as was known, the builder having got into difficulties, and shown the dead body of a middle-aged woman, fully dressed, lying face downwards in the dried remains of a pool of blood, a common table knife lying about a foot from her head.

There were several large bloodstains about the floor, but no appearance of anyone having stepped in them, nor sign of any struggle having taken place. Two rings on the third finger of the left hand had not been disturbed, and the handle of the table knife, as well as the blade, was stained with blood. At the necropsy two wounds were found on the front of the neck about three inches long, running parallel to one another at about an interval of two inches. The lower wound merely divided the skin and fat, but the upper severed the windpipe to about two-thirds of its extent, and also the principal vessels. The wounds were such as could have been made with a knife like that found, and such as might have been inflicted by the person herself. No other wounds were found, nor any

other cause of death. At the inquest it was proved that the deceased was given to drink, that she had some weeks previously purchased the knife at a stall in the street, and had not since been seen or heard of. A verdict of suicide was recorded.

In May, 1904, the editor met with a case in which a suicide had produced over seventy cuts on himself.

Two or more Mortal Wounds.—When we find several wounds on the body of a suicide, it generally happens that one only bears about it a *mortal* character, namely, that which has caused death. On this account it has been asserted by some medical jurists that when two mortal wounds are found upon a body, and particularly if one of them is of a stunning or stupefying tendency (*i.e.*, affecting the head), they must be considered incompatible with suicide. An inference of this kind can be applied to those cases only in which the two wounds, existing on different parts of the body, were likely to prove immediately fatal. It must, however, be borne in mind, that all suicides do not *immediately* perish from wounds which are commonly termed mortal: on the contrary, they have often the power to perform acts of volition and locomotion, which might by some be deemed wholly incompatible with their condition. It is difficult to say whether one wound was likely to destroy life so rapidly as to render it impossible for the person to have inflicted another upon himself; but when there are several distinct incisions on the throat, each involving important blood-vessels, there is good reason to infer that they have resulted from an act of murder. There are no rules by which, in unknown cases, the instantaneous mortality of wounds can be accurately determined—a fact which will be apparent hereafter, from a description of wounds of the head, heart, and throat.

It is not possible to say, from the mere discovery of marks of contusion or injury on the head, that the deceased must have necessarily laboured under insensibility or concussion, and have therefore been afterwards unable to inflict any other wound upon himself. Injuries of the head are attended with most singular anomalies in this respect. One person will be rendered insensible and powerless by a blow which may leave scarcely any appreciable marks; while another will be able to walk and exert himself when the skull has been fractured and depressed, blood effused, and even when a portion of brain has been lost: in short, the appearances may be such as to induce many surgeons to express an opinion that death must have taken place instantaneously. It is quite right that a medical jurist should be fully prepared for the occurrence of such anomalous cases; but a strong suspicion of homicide may fairly exist when, besides marks of great injury to the head, a severe cut or stab is found on the body. A man is not likely to cut or stab himself after having sustained severe violence to the head; but he may retain the power of precipitating himself from an elevated spot, and thereby of producing great injury to the head, after having previously attempted to cut his throat or stab himself (*Vierteljahrsschrift*, 1871, 2, 216).

A man was found lying dead in a street in a low quarter of London, with his skull severely fractured, and his throat cut. The evidence adduced at the inquest satisfactorily showed that the deceased had attempted suicide by cutting his throat in his bedroom, and had then thrown himself out of the window, by which the fracture and other severe contusions had been produced.

Had his body been thus discovered in a lonely and sequestered spot, the medical presumption would certainly have been in favour of murder. A similar remark may be made in reference to the following case, which occurred in 1872.

A man stabbed himself in the chest with a sharp instrument like a dagger, and then threw himself from a window forty feet from the ground. On examining his body the weapon was still sticking in the wound. It had penetrated the chest to the depth of six inches.

Cases of this description are usually determined by circumstantial evidence. In the following instance there could be no doubt of homicide.

A woman was found dead nearly twelve months after she was first missed. Her body was clearly identified. A handkerchief was drawn tightly round her neck, and a wound from a pistol-ball was traced through the left side of her chest, passing out at the right orbit; and three other wounds were found, one of which had entered the heart, and all of which had been made with a sharp instrument.

The prisoner charged with the crime alleged that the deceased had committed suicide—but the variety of the means and the instruments employed to produce death, as well as the fact that the gunshot wound in the head, the stab in the heart, and the act of strangulation were individually sufficient to account for speedy death, left no doubt that this was an act of murder (*Rex* v. *Corder*, Bury Sum. Ass., 1828; Will's "Circ. Evidence," p. 237).

In 1860, a young woman was found dead in a farmhouse, from a wound in her throat. This wound was seven inches long and two inches in depth; it was situated on the left side of the neck, its direction was nearly transverse, but passing slightly upwards from behind forwards. The incision commenced a little in front of the spine on the left side opposite to the second or third spinal process, and terminated about an inch and a-half from the centre of the chin, the fore part of the incision being *over* the body of the lower jaw and quite superficial, dividing only the skin, cellular tissue, and fat. The important parts involved on the left side were, the external and internal carotids, which were cut into but not across; the internal jugular vein, the pneumogastric nerve, and (at the posterior part of the wound) *the spinal cord*, were completely severed. The weapon nearly entered the joint between the second and third cervical vertebra, about two-thirds of the intervertebral substance between these bones having been divided. A portion of the second vertebra had been cut through, and was *left adherent to the lower lip of the wound*. The left vertebral artery was also completely divided. The lower lip of the wound was jagged and serrated, and the neck was slightly wounded lower down on the same side, showing that several strokes had been made in this part with the weapon. In the *left* hand of deceased a common dinner knife was found, loosely *held;* it was in a reversed position, with the back instead of the blade towards the throat. The left hand presented three incised wounds over the middle finger, one of considerable depth, and another reaching to the bone over the outer side of the ring finger. The right hand had only one slight wound upon it. The deceased was *right-handed*.

Judged by any scientific rules, such a wound as this was inconsistent with an act of suicide. Assuming that it had commenced behind, the spinal marrow was divided in such a situation that there would be instantaneous destruction of all muscular power, so that the weapon could not be carried forward to the division of the jugular vein and the two principal branches of the carotid artery in front. Assuming that the wound had commenced in front, the division of these large vessels would have rendered it impossible, by reason of the

copious loss of blood, to have carried the weapon through the inter-vertebral substance to the division of the spinal marrow and vertebral artery behind. There could be no doubt that the wound commenced behind on the left side, and that the weapon was used with great force to cause a division of the bony process of the second vertebra. Its situation, extent, and direction were all inconsistent with suicide. A suicide could have inflicted a wound in this situation and direction only with the right hand, but the weapon was lying loosely in the *left* hand of the deceased. There were deep recent cuts on the back of the left hand which admitted of explanation only on the supposition that the deceased had raised it to protect her throat. No suicide scores the backs of the hands before inflicting fatal wounds on the throat. A fellow-servant of the deceased, although not at first suspected, was tried (Carlisle Sum. Ass., 1860, *Reg.* v. *Cass*), and convicted of this act of murder upon his own confession. His clothes were examined, and it is worthy of observation that, with the exception of a few small spots on the shirt, they were free from any marks of blood. The knife found in the hand of the deceased was bent towards the end as if it had been used against some hard obstacle. It had been wiped; but it still contained in its depressions and irregularities, as well as between the layers of the handles, coagula of recent blood mixed with rust. One remarkable circumstance, brought out by the microscope, appeared to connect the prisoner with this weapon. In a small coagulum found on the knife, dried and fixed to the blade, were some woollen fibres of a peculiar purple-brown colour. These corresponded exactly to the fibres of the woollen jacket which the prisoner wore.

A case occurred in September, 1897, in Bethnal Green, very instructive in respect of deductions from a number of wounds.

A woman, Margaret Marshall, was found dead at the foot of some stairs. There was no implement about that could have caused the injuries, neither was there any broken glass nor crockery; nor, again, were there any projecting articles in the bannisters which could have caused them, had deceased fallen and injured herself. There were no less than eighteen wounds about the head and neck thus described by Dr. F. H. Oliver, who with Dr. Bate performed the autopsy.

1 and 2. An old bruise on right temple, and one on centre of forehead.

3. Above the left ear, an incised wound from right to left, one and a-half inches in length, dividing all structures down to bone, including posterior branch of temporal artery.

4. Another commencing above left ear—passing upwards and forwards from left to right, two inches in length, clean cut and deep, dividing branch of temporal artery.

5. On the top of forehead and to the left, a three-quarters of an inch cleancut from above downwards.

6. Lower down the forehead and on the left side, a gaping wound, one and a-quarter inches in length, with bruised edges, laying bare the skull.

7. Outer side of left eyebrow, cutting from below upwards, a deep, clean cut wound, one and a-quarter inches in length.

8. A clean cut wound, one inch in length, penetrating the orbital cavity and chipping a piece off the bone at the external angular process (left side), upper angle of wound bifurcated.

9. A mere scratch across the upper left eyelid.

10. A clean cut gaping wound of the lower eyelid, commencing at the inner canthus, and passing outwards for one and three-eighths of an inch, ending in a scratch.

11, 12, 13, 14. Four deep scratches under lower lid.

15. About centre of left cheek, a three-quarters of an inch clean cut, running

upwards or downwards, almost parallel with the lower jawbone, cutting through the skin only.

16. On the lower edge of chin, a similar wound.

17. A deep lacerated wound, three-quarters of an inch in length, just above the free margin of upper lip, running from middle line downwards and outwards to left, not penetrating to inner mucous surface.

18. A very large wound, lacerated and gaping widely, from septum of nose downwards and outwards to the left angle of lip—edges bruised—soft structures covering the upper jaw ploughed up very deep; length of wound, two and one-eighth inches.

Upper jaw comminuted—malar bone broken, nose broken, some teeth missing from jaw; face not swollen.

Dr. Oliver's deductions from some of the wounds was that No. 3 was alone enough to have caused death, and if Nos. 4 and 6 were compatible with and even suggestive of a hard blow with a blunt instrument, No. 18 had certainly been given by a blunt instrument, the remainder might have been given with a sharp instrument, and No. 8 was as if produced by a thrust with a sharp chisel or similar weapon.

With regard to any given individual wound, there was no impossibility of its being accidentally, or even suicidally inflicted, but when the number and position of all of them were taken into consideration, it was impossible that the case could have been either suicide or accident, and a verdict of murder against an unknown person was returned by the coroner's jury; beyond this the case never went.

When several wounds are found on a dead body, the question is frequently asked,—**Which was first received?** If one is what is commonly termed mortal, and the others not, it is probable that the latter were first inflicted. This remark applies both to cases of homicide and suicide; but it is apparent that when, in a murderous assault, a person has been attacked by several assailants at once, the wounds may have been simultaneously produced. This is, however, a question to which it is not easy to give a specific answer. Each case must be decided from the special circumstances attending it; and in most instances, unless some direct evidence is forthcoming, a medical opinion can be little more than conjectural. This question is almost always put in a court of law; and a witness should at least prepare himself to meet it, by a proper examination of the medical circumstances of the case.

At the end of 1903 the following case occurred to the editor :—

A girl was brought into the London Hospital with two wounds, one of which had penetrated the heart and caused death from hæmorrhage, the other had perforated the left kidney, the spleen and stomach; around the latter there was very little bleeding, while around the former was much blood-clot; the case was a clear one of murder, and the accused was hanged. The medical evidence clearly proved that the heart wound was caused first, and the other one only when circulation was rapidly failing; the interval between them was, however, only to be measured by seconds, for there were witnesses to prove the circumstances.

If several wounds have been inflicted through the *dress*, an examination of this may sometimes suffice to show which was first received.

A man, in struggling with an assailant, received three stabs with a knife—two on the left elbow, and the third in the back. The latter was at about the level of the eighth rib, was vertical to the chest, and had clean edges. The lower margin was obtuse—the upper acute; hence it was evident that the cutting edge of the weapon had been directed upwards. It had traversed the left lung and the heart, and had caused immediate death. It was obvious, on examination, that this mortal wound had been first received, and the stabs at the elbow inflicted subsequently.

These two stabs, which were slight, had divided the cloth coat and shirt, and had only grazed the skin, so that no blood had been effused. But the edges of the cuts in the cloth coat and shirt were stained with blood; hence it was evident that they must have been produced by a weapon already rendered bloody by a previous wound. The fact was of some importance in the case, and the correctness of the medical opinion was confirmed by the evidence at the judicial inquiry.

Evidence from Foreign Bodies in the Wound.—Foreign substances are sometimes discovered in contused or lacerated wounds: and these may throw an important light on the circumstances under which a crime has been perpetrated.

In *Reg.* v. *Hazell* (Taunton Lent Ass., 1848) the body of the deceased was found in a well. When examined, there were on the head several severe wounds sufficient to account for death. There was much blood on the clothes and face, and in the blood were sticking a quantity of hay-seeds, which led the medical witnesses to consider that the wound must have been inflicted in a stable, or in some place where there was hay. On examining a neighbouring stable, the spot where the murder was committed was rendered evident by the discovery of marks of blood. There may be found in the wound a portion of the weapon itself. The preservation of this is necessary, as it may serve to connect the prisoner with the act, should his criminality be otherwise doubtful. In *Reg.* v. *De Salvi* (C. C. C., October, 1857) it was proved that the deceased died from a stab inflicted on him by the prisoner. Two inches of the pointed portion of the blade of a knife were found imbedded in one of the vertebræ. The spinal cord had been divided, and paralysis, ending fatally, was a result of the wound. The identity of the weapon was not only established, but tho force by which it had been used by the prisoner was thus clearly indicated.

In the case of a man named Moore, charged with murdering his wife in Finsbury, in 1859, it was proved that the woman's throat had been cut through to the spinal column. The surgeon, in making a minute examination of the deceased's neck, found small particles of steel, which had formed part of the edge of a cutting instrument, broken off and imbedded in the muscles and bones. These were examined microscopically, and their nature verified. They were covered with blood. In a box in the prisoner's room two razors were found. The blade of one of these, stained with blood from end to end, had been partly wiped. The edge of this razor presented several notches, corresponding to the portions of steel found on the vertebra of deceased. The handle of the razor was also partly unriveted, showing that it had been used with very great force.

Suicide was not only thus disproved, but the act of murder was fixed upon the accused.

8. Evidence from the Surroundings.

In pursuing the examination of the question respecting the homicidal or suicidal origin of wounds, the attention of the reader may be called to the force of evidence which is sometimes derived from the circumstances under which the body of a person dead from wounds is discovered. It may be said that this is a subject wholly foreign to the duties of a medical jurist, but the author cannot adopt this view. There are few in the profession who, when summoned to aid justice in the detection of crime, do not seek for circumstances by which to support the medical evidence required of them. A practitioner would certainly be wrong to base his professional opinion exclusively on these circumstances, but it is scarcely possible for him to avoid drawing an inference from them as they fall under his observation. His evidence may be of itself weak and insufficient to support the charge against an

accused party; in such a case if any suspicious circumstances have come to his knowledge, he may be often unconsciously induced to attach greater importance to the medical facts than he is justified in doing. In short, he may, through a feeling of prejudice, which it is not always easy to avoid, give an undue force to the medical evidence. But if a proper degree of caution is used in drawing inferences, and the circumstances are not allowed to create a prejudice in his mind against the accused, a practitioner is bound to observe and record them; for, being commonly the first person called to the deceased, many facts capable of throwing an important light on the case would remain unnoticed or unknown, but for his attention to them. The position of a dead body, the distance at which a knife or pistol is found, the direction of the instrument, whether situated to the right or left of the deceased, the marks of blood or wounds about the person, or of blood on the clothes or furniture of the apartment, are facts which may assist materially in developing the real nature of a case, and in giving force to a medical opinion. Many of these circumstances can fall under the notice of him only who is first called to the deceased; and, indeed, if observed by another, no advantage could be taken of them, except from the interpretation of a medical man.

Among the questions which present themselves on these occasions are the following:—Is the position of a wounded body *that* which a suicide could have assumed? Is the distance of a weapon from the body such as to render it improbable that it could have been placed there by the deceased? In answering either of these questions, it is necessary to take into consideration the extent of the wound, and the time at which it probably proved fatal. Again, it may be inquired, Has the deceased bled in more places than one? Are the streams of blood all connected? Are there any marks of blood on his person or clothes, which he could not well have produced himself? Are there any projecting nails or other articles which might account for wounds on the body as the result of accident? These are questions, the answers to which may materially affect the case: hence a practitioner, in noticing and recording the circumstances involved in them, ought to exercise due caution. "The consideration of the nature of circumstantial evidence," observes Starkie, "and of the principles on which it is founded, merits the most profound attention. It is essential to the well-being at least, if not to the very existence of civil society, that it should be understood that the secrecy with which crimes are committed will not insure impunity to the offender. At the same time it is to be emphatically remarked that in no case and upon no principle can the policy of preventing crime and protecting society warrant any inference which is not founded on the most full and certain conviction of the truth of the fact, independently of the nature of the offence and of all extrinsic considerations whatever. Circumstantial evidence is allowed to prevail to the conviction of an offender, not because it is necessary and politic that it should be resorted to, but because it is in its own nature capable of producing the highest moral degree of certainty in its application. Fortunately for the interests of society, crimes, especially those of great enormity and violence, can rarely be committed without affording vestiges by which the offender may be traced and ascertained. The very measures which he adopts for his security not

unfrequently turn out to be the most cogent arguments of guilt. On the other hand, it is to be recollected that this is a species of evidence which requires the utmost degree of caution and vigilance in its application." Several of the above questions arose on the occasion of the trial of the brothers Peltzer at Brussels, in 1882, for the murder of M. Bernays.

The rule respecting the admissibility of this kind of evidence applies to circumstances of a *medical*, as well as those which are of a physical or moral kind. Medical circumstances, when properly observed and interpreted, are often of the highest importance. In order to convict an accused person on circumstantial evidence, the facts proved in the case should be consistent with his guilt, and be utterly inconsistent with his innocence; or, in the language of a judge, a certain number of material facts should be incontestably proved in the case, which are quite inconsistent with the innocence of the prisoner. These facts should be such as to render it impossible in the minds of the jury that any one but the prisoner could have committed the murder. Alderson, B., in charging a jury to this effect, made an observation in reference to circumstantial evidence which should be remembered by medical witnesses. He pointed out to them the "proneness of the human mind to distort the facts in order to establish such a proposition (the guilt of the prisoner), forgetting that a *single circumstance* which is inconsistent with such a conclusion is of more importance than all the rest, inasmuch as it at once destroys the hypothesis of guilt."

There are many cases on record in which an observation of slight and unexpected circumstances by medical men, has led to the detection of offenders.

In the life of Sir Astley Cooper, it is mentioned, that when called to see Mr. Blight, of Deptford, who had been mortally wounded by a pistol-shot in the year 1806, he inferred from an examination of the localities that the shot must have been fired by a *left-handed* man. The only left-handed man near the premises at the time was one Patch, who was not in the least suspected, a particular friend of the deceased. This man was, however, subsequently tried and convicted of the crime, and he made a full confession of his guilt.

Position of the Body and Clothes.—The body may be found in a position which the deceased could not have assumed on the supposition of the wound or injury having been accidental or suicidal. The position of a dead wounded body is often only compatible with homicidal interference, either at the time of death or afterwards (case of Bernays, 1882). In order to determine the probable time of death, we should always notice whether there is any warmth about the body—whether it is rigid, or in a state of decomposition, and to what degree this may have advanced. The importance of such observations in a case of alleged murder has been elsewhere considered.

The position of the body when a wound was inflicted is a frequent question on inquests and criminal trials. In the case of Lord William Russell (*Reg.* v. *Courvoisier*, C. C. C., 1840), the throat had evidently been cut while the deceased was lying in bed; the blood was effused on each side of the neck only. There was also found a wound on the thumb of the right hand of the deceased, probably inflicted at the time the hand was put up to defend the throat. The case of Mrs. Gardner (*Reg.* v. *Gardner*, C. C. C., October, 1862), already referred to as illustrating other important medico-legal points (see p. 471),

bears a strong resemblance to that of Lord W. Russell, but the proofs of murderous interference with the deceased were still stronger. Her throat had been cut while she was in the recumbent position. Sequeira found an impression made by sooty fingers on the inside of the left wrist, and a similar sooty impression on the left elbow, as if it had been forcibly grasped. On the inside of the right thigh there was the impression of the palm of a bloody hand of full size, pointing downwards. He noticed these marks before the prisoner, who was a chimney-sweep, had entered the room; and he also observed that there was no soot on the hands of the deceased, and no blood sufficient to produce such an impression of blood as that existing on the right thigh. The impression was also larger than the hand of the deceased.

In a case of fratricide referred to Dupuytren, the deceased had received a severe wound at the lower part of the neck, and another in the front of the chest, which had led to his death. As the blood had run down the front of the person from both of the wounds, and one of them was so deep that the deceased, unless supported, would probably have immediately fallen, Dupuytren inferred that two persons had been engaged in the murder, and that one held the deceased by the arms while the other struck him in front. This suspicion was corroborated by there being no marks of wounds upon the hands. The opinion thus expressed was singularly confirmed by the evidence adduced at the trial of the murderer ("Ann. d'Hyg.," 1829, 1, 465). If the deceased has been wounded with his clothes on, we should notice whether any part of his dress has or has not been cut or injured over the situation of the wound, whether the cut portions of dress are bloody, and whether the blood has been effused or applied on the *inside* or *outside*. When, together with a wound in the throat, we find the cravat and the shirt, or in a female the collar or bonnet or cap-ribbons, cut through, this, all other circumstances being equal, is strongly presumptive of homicide. A person intending suicide, unless labouring under confirmed insanity, would not allow any mechanical obstacles of this kind to remain as an obstruction to the use of the weapon. In one case of homicidal wound of the throat, inflicted in the recumbent posture, the cravat of the deceased had been lifted up, and afterwards allowed to drop over the wound, in order to conceal it. The importance of examining the dress, and comparing it with the marks of violence on the body, has already been pointed out.

Marks of Blood or other Substances on the Deceased and in the Room.—All marks or stains of blood or dirt on a dead body require special observation. The impression of a hand, or of some of the fingers, may be found on the skin in a situation where it would have been improbable or impossible for the deceased to have produced it, even supposing that one or both of his hands were covered with blood. In one case of murder there was found the bloody impression of a left hand upon the back of the *left hand* of the deceased, in such a position that it was quite impossible the deceased himself could have made the mark. In all cases it should be noticed whether the *inside* or *outside* of the hand or whether one or both hands are marked with blood, and the size and position of the marks should be described. Stains of blood on the dress of a wounded person or dead body may often furnish important circumstantial evidence. If there are several stabs

or cuts on the body involving the dress, it should be observed whether the edges of one or more of them are stained with blood, as if from the wiping of a weapon, and whether the stain is on the outside or inside of the article of dress. In simulated personal injuries, the stain of blood may be through inadvertence applied to the outside of the dress—a fact which might, in some instances, lead to the detection of the imposture. (See case by Bayard, "Ann. d'Hyg.," 1847, 2, 219.) In judging from marks of blood in the *apartment*, we must take care that we are not unconsciously misled by the accidental dispersion of this liquid by persons going in and out or touching the body. The following case, which occurred in France, will show the necessity of extreme caution. A young man was found dead in his bedchamber, with three wounds on the front of his neck. The physician who was first called to see the deceased had unknowingly stamped in the blood with which the floor was covered, and had then walked into an adjoining room, passing and repassing several times; he had thus left a number of bloody footprints on the floor. No notice was taken of this at the time; but on the following day, when the examination was resumed, the circumstance of the footprints was particularly attended to, and excited a suspicion that the young man had been murdered. The suspected person was arrested, and would have undergone a trial on the charge of murder had not Marc been called in to examine all the particulars of the case. A similar circumstance occurred in the case of Eliza Grimwood, who was murdered at Lambeth in 1838.

Marks of Blood on Furniture.—It is proper to notice all marks of blood on the clothes of the deceased or in the apartment, and to observe where the greatest quantity of blood has been effused; this is generally found on the spot where the deceased has died. The deceased may have bled in more places than one; if so, it should be noticed whether there is any communication in blood between these different places. Blood on distant clothes or furniture will show whether the deceased has moved or has been moved about, and whether he has struggled much after receiving the wound. Acts of locomotion by a wounded person who has died from loss of blood, or by a criminal whose hands and feet may be bloody, are generally indicated by tracks or marks of blood. The observation of these marks is of medical importance, if made at the time that a dead body is found. They may be so situated as to show that the body has been moved or been interfered with after death and thus throw a light upon the question whether the act has been one of homicide or suicide.

In *Reg.* v. *Hatto* (Bucks Lent Ass., 1854), a mark of blood, as from the smear of a hand, was traced along the passage of the house in which the body of the deceased was found. The mark was continued over the doorpost into a back room, which was found locked and bolted on the inside. The crime was thus fixed upon the prisoner, for no one breaking into the house in front could have had access to this room. The evidence thus brought against him was derived from his feeling his way with a bloody hand in the darkness after the murder. He was not at the time aware that he was thus leaving impressions which would show that no one but himself could have perpetrated the crime.

It is a fair subject of medico-legal inquiry on these occasions whether there are any marks of blood about the apartment or the

spot where a murder is alleged to have been perpetrated, which no one but the assassin could have produced.

In the case of Mr. Briggs (*Reg.* v. *Muller*, C. C. C., October, 1864) it was proved that the outside handle of the carriage door, in which the fatal assault was made, was marked with blood, while there was no blood upon the hands of the deceased, which were examined soon after the occurrence. This was adverse to the theory that deceased had opened the door and had fallen out, while it proved that a hand stained with fresh blood had been in contact with it.

In the case of Mrs. McPherson (*Queen* v. *Jessie McLachlan*, Glasgow Circ. C., September, 1862), Macleod observed footprints in blood in the bedroom of the deceased, who was found dead from wounds obviously homicidal. There were three imprints of a naked left foot, one of them particularly well marked. There was the impression of a small well-formed foot at rest. Before any suspicion was attached to any one the medical witness expressed an opinion that they were made by a woman's foot with a high instep. At the time of this act of murder there were only three persons in the house: the prisoner, the deceased, and a man aged eighty-seven, James Fleming. Macleod observed, when he made an inspection of the body, that there was no blood on the feet of the deceased; further, he made a careful outline of her left foot, and found that it did not in any way correspond to the foot-prints on the floor of the room. The foot of the deceased was larger in all dimensions, it was longer and broader, and had a large bunion. In his opinion the left foot of the deceased could not have produced these marks. He compared the foot of James Fleming with the footprints, and they were obviously quite different; he had a flat foot, in contradistinction to a high sole, by which the marks had been produced. He was quite satisfied that the old man's foot could not have caused them. He also compared the feet of the prisoner with these marks, especially the left foot, and the marks in his judgment might have been produced by her foot. The accused made no objection to tread with her left foot in a thin layer of bullocks' blood and then step on a plank of wood. When all the conditions of the floor were imitated, two impressions were obtained which corresponded with a marvellous degree of accuracy with the marks taken from the house. In the minutest detail of measurement and outline they tallied with the original ("Report of Med. Evid." by Macleod, 1862, p. 13).

This was one among the numerous circumstances which tended to fix the act upon the prisoner.

In Gardner's case it was remarked by the surgeon that there was no blood on the wainscot or part of the bed furniture of a room where, had the woman Humbler perpetrated or participated in the act, it was supposed it would be found. On the following day, the fourth day after the murder, some blood was pointed out in this situation by the prisoner; it had the appearance of having been recently splashed or smeared, and one patch was still wet. This had been obviously done to furnish that evidence against the woman by which the prisoner hoped to avert suspicion from himself. Fortunately the room had been well examined on the previous day by the surgeon and a policeman, and they were able to depose that the marks of blood in the room had been caused after their examination.

The case of *Reg.* v. *Spicer* (Berks Lent Ass., 1846) affords an illustration of the importance of examining wounds minutely, as well as the locality where a dead body is found, when it is suggested that death has been caused by accident:—

> The prisoner was charged with the murder of his wife, and the evidence against him was chiefly circumstantial. The deceased was found dead at the foot of a stair, as if she had accidentally fallen backwards. The parietal bone was fractured, and the fracture had extended to the base of the skull. The brain was lacerated, and there was great effusion of blood. The second vertebra of the neck was fractured, and the spinal marrow torn through. These injuries were quite sufficient to account for death, and had they existed alone there might

have been no reason to charge the husband with the murder. But there was a recent wound on each side of the temple, partly lacerated and partly bruised, and a branch of the right temporal artery had been divided, this injury having been inflicted apparently with a pointed blunt instrument. There were marks of blood on the wall at the top of the staircase, and a pointed stone covered with blood was found near to the body. It was therefore obvious, as the deceased had fallen on the summit of the head, that the injuries to the two temples *laterally* could not have been accidentally produced during the fall, for there was no projecting body against which she could have struck in her descent to produce them; and when the force of the fall had been spent on the head, her body could not have rolled over so as to produce punctured and lacerated wounds on both temples. All the facts tended to show that a murderous assault had been made upon her at the top of the stair, and that she had afterwards fallen or had been pitched headlong backwards. The injuries received previously to the fall might have stunned her, and might not have sufficed to account for death; but their nature and situation furnished strong proof that they could not have arisen from any accidental causes operating simultaneously, and that they were neither of accidental nor suicidal origin. The prisoner was convicted (*Med. Gaz.*, vol. 37, p. 610).

Inference from the Quantity of Blood.—When the blood-vessels of the neck have been divided to the vertebral column, and the amount of blood on the spot where the body is found is small, there is reason to infer that the act is homicidal, and that the wound has been produced soon after death from some other cause. In reference to young children the question of self-infliction cannot be raised to embarrass the case. Nevertheless from such a wound as that inflicted on the deceased there should be evidence of spirting and copious loss of blood, but the quantity of blood on the spot where the body of the child was found was so small (about two tablespoonfuls) compared with the severe wounds on the neck, that the medical man properly drew the conclusion either that the wounds had been inflicted elsewhere, or that they had been produced on the body after active circulation had ceased. There was reason to believe that the child had been first suffocated, and the severe wound dividing the bloodvessels of the neck inflicted soon afterwards, although this is not in accordance with the prisoner's confession. A case somewhat similar, involving the death of a lady of good social position, occurred in the United States a few years since.

This lady was found dead in bed with her throat cut, and the bedclothes smoothly arranged about her person. Although the soft parts of the neck, including the carotid arteries, the windpipe, and the gullet, were cut through to the spinal column, there was no appearance whatever of a jet or spirt of blood, or as if blood had been poured out from the divided vessels. There was no blood on the fore part of the neck above or below the cut, nor on the hands, with the exception of a small stain on the inside of the fingers of the right hand. The blood effused is said not to have exceeded a quart; this had evidently escaped from the wound in the neck, and had flowed down behind the body. Beside these marks there was a spot of blood on the sheet in front of the body entirely removed from the wound, and other spots on the bedclothes. The blood continued to ooze freely from the wound for twenty-four hours after death, in spite of the efforts made to repress it. Was this a case of murder or suicide?

Apart from all moral circumstances, the medical facts were such as to justify the inference that this wound was homicidal. The attitude of the body, as if laid out; the razor partly closed, found under the right arm; the hand not bloody; the absence of blood from the front of the person, showing that this deep and extensive wound, if suicidal, must have been inflicted while the deceased was lying down; and,

above all, the small quantity of blood (one quart) which had flowed from a wound involving all the great vessels of the neck to the spinal column, were facts presumptive of homicidal interference. Had the throat been cut while the deceased was living, there would have been a great flow or spirt of blood, but, as there was no evidence of this, Swinburne and others who investigated the case came to the conclusion that the woman had been first suffocated or strangled, and her throat cut while she was lying down.

Observations made in carrying out sentences of execution by decapitation show that on a division of the great bloodvessels of the neck during active life the flow of blood is copious and instantaneous. In the case of Mrs. Gardner, the body was straight on the floor, as if laid out, and although the carotid artery had escaped division, there was a pool of blood on the floor on each side of the throat, and this had run down the back. A quantity of blood escaping from the thyroideal artery had entered the windpipe and caused death by suffocation.

When spots of blood are found upon articles of dress or furniture their *form* and *direction* may occasionally serve to furnish an indication of the position of the person with respect to them when the wound was inflicted. Thus, if the form of a spot is oval and elongated, the presumption is that the person was placed obliquely with respect to the stained article during the hæmorrhage. The force with which the blood has been thrown out will be in some measure indicated by the degree of obliquity and length of the spot. This is in general wide and rounded at the upper part, but narrow and pointed below. The case of Spicer furnishes some suggestions on the importance of evidence occasionally derived from an examination of the form and direction taken by spots of blood :—

> At the top of the stair, and at the height of four or five feet above its level, several spots of blood were observed upon a brick wall. These were rendered evident by the wall having been recently whitewashed. The spots took an oblique direction from above downwards, were of a pale red colour at the upper part, but dark red below, terminating in a point consisting of the fibrin and the greater part of the red colouring matter. Their form and regularity proved that they had proceeded from a small artery, and that the wounded individual could not have been very distant from the wall, while their shining lustre rendered it probable that they were of recent origin, and their well-defined termination in a firm coagulum showed that they had probably proceeded from a living bloodvessel. The deceased had died from fracture of the skull and spinal column by a fall from the top stair; one branch of the right temporal artery was found divided, and this wound could not have been produced by the fall. It was therefore evident that a murderous assault had been made upon the deceased at the top of the stair, and this had led to the spirting of the arterial blood on the brick. The height at which the spots existed and their appearance proved that the jet of blood had been from above downwards, thereby rendering it probable that deceased was standing up, or that her head was raised at the time the wound was inflicted. Further, as the brick with the spots was on the left hand in the descent, and the wounded artery was on the right side, it is probable that deceased was face to face with her assailant in the act of ascending the stairs, and that she was killed by being precipitated backwards to the bottom. The position in which the body was found in the cellar corroborated this view (*Med. Gaz.*, vol. 37, p. 612).

In January, 1904, Mrs. Piernick was found dead in her room with her throat cut, and from this cut she had evidently died. Of the cut itself Dr. Samuel Lloyd, the police divisional surgeon, frankly favoured the view of a suicidal origin, though he admitted that it might have

been inflicted by somebody else. It could not have been done by broken glass. Dr. Pepper, the Home Office expert, was more circumspect. Judging solely by the nature of the wound, which ran transversely from left to right, he would have thought it self-inflicted. But, he added, "to say that it must have been so inflicted would be going much too far." The wound, though suicidal in appearance, could have been made by another person than Piernick. It had not severed the windpipe nor the principal vessels, so that death had probably been delayed some time after its infliction. He dismissed the half-suggestion that it could have been done with a finger-nail or the pieces of broken lamp-glass found in the room. The wound must have been made by some sharp instrument.

The case has, to the editor's knowledge, never been cleared up. There were two or three very serious difficulties in the way of suicide: (*a*) The weapon was not found in the room, nor has it ever been discovered; (*b*) The door of her room was locked and the key has never been found; (*c*) The windows and shutters were closed when the body was discovered.

9. Evidence Derivable from the Weapon.

There are several points about a weapon which may afford very strong evidence.

The Position of the Weapon.—If a person has died from an accidental or self-inflicted wound, likely to cause death either immediately or within a few minutes, the weapon is commonly found either near the body or within a short distance of it. If found near, we must notice on which side of the body it is lying, and if at a short distance, consider whether it might have fallen to the spot, or have been thrown or placed there by the deceased. If there has been any interference with the body, evidence from the relative positions of it and the weapon will be inadmissible. In one case, a woman had evidently died from a severe wound in the throat, which was homicidally inflicted; the weapon, a razor, was found under the left shoulder, a most unusual situation, but which, it appears, it had taken owing to the body having been carelessly turned over before it was seen by the surgeon first called.

It is compatible with suicide that a weapon may be found at some distance, or in a concealed situation; but it is much more frequently either grasped in the hand, or lying by the side of the deceased. In one instance, the deceased was discovered in bed with his throat cut, and the razor lying *closed* or shut by his side. In another case, the bloody closed razor was found in the deceased's pocket. In a wound involving the great bloodvessels of the neck, it is most improbable that there should be any power to close or shut the razor with which the wound was inflicted; and there are fair grounds to suspect interference when a razor is thus found closed in the hand. There is, however, one circumstance in relation to a weapon strongly confirmatory of *suicide*. If the instrument is firmly grasped in the hand of the deceased, no better circumstantial evidence of suicide can be offered. It is so common to find knives, razors, and pistols grasped in the hands of suicides, that it is unnecessary to produce cases

illustrative of this statement. The grasping of a weapon appears to be owing to muscular spasm persisting after death, and manifesting itself under the form of what has been called cadaveric spasm. It does not seem possible that any murderer could imitate this state, since the relaxed hand of a dead person cannot be made to grasp or retain a weapon, like the hand which has firmly held it by powerful muscular contraction at the last moment of life (*vide* "Instantaneous Rigor").

In reference to the weapon being found at a distance from the body, all the circumstances of the case should be taken into consideration before any opinion is expressed. If the weapon cannot be discovered, or if it is found concealed in a distant place, this is strongly presumptive of homicide, provided the wound is of such a nature as to prove speedily fatal. In the case of Lord W. Russell in 1840, no weapon could be found; and although the wound in the throat bore somewhat of the characters of a suicidal incision, the absence of the weapon was sufficient to show that a wound which was certain to be rapidly fatal must have been the act of a murderer. The assassin had used a carving-knife, which he had afterwards washed, and then replaced in the tray with the other knives.

Something may be learned from the actual nature of the weapon itself taken in conjunction with the circumstantial evidence as to why the particular weapon was used. For instance, in December, 1903, an Italian, named Bella, committed suicide at Gillingham, Kent, in a most determined manner by plunging a pair of scissors into his neck. He was a bad-tempered man, and had been greatly upset by his wife leaving him. The woman, accompanied by relatives, went back to get her wearing apparel, and Bella, who had expressed his intention to end his life, put his threat into execution whilst they were in the house.

Nature of its Edge.—It should be noticed whether the weapon is sharp or blunt, straight or bent, and whether the edge is or is not notched. These circumstances may throw a light on the question of suicide or murder.

In *Reg.* v. *Gill* (Dublin Commis. Court, November, 1860), the prisoner, an old man, was charged with the murder of his wife. The woman was found dead with a wound in her throat dividing the larynx as well as the thyroid arteries and gullet at the thyroid cartilage. It penetrated to the front of the spine, which was hacked and notched apparently with some violence. Several pieces of bone were detached. The right hand of the deceased was turned back, and a blunt knife was lying in it loosely, and not grasped. The cut through the skin and muscles of the throat was clean, and had evidently been made by a sharp instrument. On the left side the cut had two extremities presenting an appearance as if the weapon had been twice used in cutting. The knife found in the hand of deceased was not only blunt, but turned at the point, and it had no handle. There was a mark of a bloody finger on the dress over the left shoulder of deceased.

From this state of facts Porter and Geoghegan drew the conclusion that deceased had not inflicted this wound on herself. Among other circumstances, the hacking of the spinal column and the evidence of two separate cuts were adverse to the theory of suicide. Further, the wound had not been made with the knife found in the hand. If this weapon had been used for the purpose of suicide, it would either have been grasped in, or have altogether fallen out of, the hand. The

deceased had not produced the bloody mark of a finger found upon her dress. These conclusions were fairly justified by the facts. A blunt knife had been substituted for a sharp razor; the placing the knife in the hand had failed to give the appearance presented in suicide; and the nature of the wound was inconsistent with the idea of self-infliction. The prisoner was, nevertheless, acquitted.

Blood on Weapons.—For the methods of obtaining and testing blood *vide* "Tests for Blood."

The weapon with which a wound has been inflicted is not necessarily covered with blood. The popular view is that, if much blood is found about a dead body, the weapon ought always to be more or less bloody. In reference to heavy blunt instruments applied with force to the head, severe contusions and fractures may be produced without immediate effusion of blood. Unless the bludgeon is used in a subsequent struggle, or handled by a bloody hand, no blood whatever may be found on the end which produced the injuries. In reference to stabs, the knife is frequently without any stains of blood upon it, or there is only a slight film, which on drying gives to the surface a yellowish brown colour. The explanation of these facts appears to be that in a rapid blow or plunge the vessels are compressed, so that bleeding takes place only after the sudden withdrawal, when the pressure is removed. Even if blood should be effused, the weapon, in being withdrawn, is sometimes cleanly wiped against the edges of the wound, owing to the elasticity of the skin. Thus the first stab through the dress may not present any appearance of blood on the outside, but in a second stab with the same weapon the outside of the dress should present a bloody mark, unless the weapon had previously been wiped. The blood may have been removed by washing from the blade of a knife or dagger. The handle and inner portions should therefore be closely examined. In a case of alleged murder in 1857, no blood was found on the blade of a knife or in the notch for opening it; but on removing the buckhorn handle a coagulum of blood was found between this and the plate of iron to which it was riveted.

When a weapon is bloody particular attention should be given to the manner in which the blood is spread over it. In cases of imputed wounds, or in the attempted concealment of murder, it is not unusual for a criminal to besmear with blood a knife or other weapon which has probably not been used, and to place it near the body. A young man alleged that he had received a cut on the forehead by a blow from a cutlass, which he produced. It was observed by Marc that the weapon was smeared with blood on both surfaces, but the layers were thicker towards the handle than at the point. The wound on the forehead was a clean incision; a cap, which the complainant wore, had been cut through. It was obvious, therefore, that the blood on the weapon could not have proceeded from this cut, for it would have been wiped, or only left in thin streaks, and more towards the point than the handle, by the act of drawing it through the clothes in producing the wound. There was no doubt that blood had been intentionally applied to this blade ("Ann. d'Hyg.," 1829, 1, 263). In the case of Doidge (Cornish Sum. Ass., 1862), the weapon, a large cleaver, had been wiped on the smock of the deceased, but although the blood had been thus in great part removed from the surface of the blade, it had

been wiped into the recesses of the letters of the maker's name, which were found to contain dry coagulated blood.

The blood on a weapon may be wet or dry, in a partly coagulated state, or spread out as a mere film. If coagulated, this would render it probable that it had issued from the body of a living person or animal, or from a body recently dead. The blood of a *dead* animal dried in small spots on the blade of a knife may sometimes present a similar appearance, and thus lead to a mistake in evidence. This question arose in the case of *Reg.* v. *Nation* (Taunton Spring Ass., 1857). The deceased was found dead in a cart with his throat cut, and there could be no doubt that this was an act of murder. The prisoner, who had been last seen in his company, was arrested, and a knife was found in his possession, on the blade of which there were marks of blood. On the part of the prosecution it was contended that the knife had been used for cutting the throat of the deceased; while, according to the defence, it had been used for cutting raw beef. A chemical witness, who was called for the prosecution, stated that the knife had been immersed in *living* blood up to the hilt; that it was *not* the blood of an ox or a sheep; and that there were on the blade of the knife certain scales or empty cells, such as are found in the mucous membranes of the throat (epithelial scales?). They were much larger than the globules of the blood, and were perfectly distinguishable by the microscope. From the appearance he thought the knife had passed through the mucous membrane which forms the lining of the throat. If this evidence was trustworthy, there was an end of the defence; with the admission of the statement that there were scales of the mucous membrane of the *throat* (the gullet?) upon the blade, no further proof was required that the weapon had been used for cutting a throat. Fortunately, however, for the ends of justice, there were other circumstances which brought the crime home to the prisoner, and he was convicted (*Med. Times and Gaz.*, 1857, 1, p. 365). Cockburn, C.J., in commenting on these microscopic subtleties, said, "in admitting the advantages of science, they were coming to great niceties indeed when they speculated upon things almost beyond perception, and he would advise the jury not to convict upon this scientific speculation alone." The editor leaves this opinion in, merely to draw attention to the advance of education in the last half-century: the microscope is now as reliable a means of providing evidence as the naked eye, or even more so, and such a sneer at it would, one may hope, be now impossible from the mouth of a judge.

In 1891 a man was convicted of the murder of a prostitute in New York, when the evidence of Austin Flint of the finding of blood and matter derived from the small intestines beneath the finger-nails and on the clothes, etc., of the murderer, was highly important. The finding of tyrosine and bilirubin, one of the pigments of bile, besides matters which might have come from the large intestine, was held to be conclusive that the presence of these matters was not due to the filthy habits of the prisoner (*New York Med. Jour.*, July 11th, 1891.

The Use of Several Weapons.—In general, suicides, when foiled in a first attempt, continue to use the same weapon; but sometimes, after having made a severe incision in the throat, they will shoot themselves, or adopt some other method of self-destruction. These cases

can only appear complicated to those who are unacquainted with the facts relative to self-murder. Neither the presence of several wounds by the same kind of weapon, nor of different wounds by different weapons, can be considered of itself to furnish any proof of the act having been homicidal. One instance has been already related in which a lunatic in committing suicide inflicted *thirty* wounds upon his head. In a case of murder, when many wounds are found on a dead body, it may happen that the situation or direction of some will be incompatible with the idea of a suicidal origin. Thus a stab or cut may be close to a contusion or contused wound, and although a fall or other accident might account for the latter, the former would indicate violence separately inflicted.

Hair and other Substances on Weapons.—In some instances no blood may exist on a weapon, but a few hairs or fibres may be found adhering to it if the weapon is of a bruising or cutting kind. The main question may be in such a case whether the fibres are of cotton, linen, silk, woollen, or other fabric, and whether the hair is that of a human being or of an animal. For the means of identifying such fibres *vide* "Identification of Hair."

In *Reg.* v. *Harrington* (Essex Lent Ass., 1852), a razor was produced in evidence, with which it was alleged the throat of the deceased had been cut. The edge was examined, and from a coagulum of blood some small fibres were separated, which, under the microscope, turned out to be cotton fibres. It was proved at the trial that the assassin, in cutting the throat of the deceased while lying asleep, had cut through one of the strings of her cotton nightcap. This was a strong circumstance to show that the razor produced was the weapon with which the fatal wound had been inflicted.

In *Reg.* v. *Steed* (Maidstone Sum. Ass., 1863), Pavy and the author examined the boots of the prisoner, who was charged with the murder. The marks of violence about the head showed that the assailant had trampled on the deceased after he was on the ground, producing severe wounds which led to his death. Some hairs were found firmly wedged beneath the large hobnails of the boots, and in certain dark stains of coagulated blood on the leather there were some red woollen fibres. The hair was compared with a portion cut from the head of the deceased, and corresponded in colour and size. On inquiry it was found that at the time of his death the deceased wore around his neck a red woollen comforter, of which the wool corresponded in colour and appearance with that taken from the prisoner's boots. The case was brought home to the prisoner by a variety of circumstances, all inconsistent with his innocence. A case is elsewhere referred to (*Reg.* v. *Cass*) in which the dried blood upon a knife lying near the body of deceased was found, on a microscopical examination, to lock up within it certain fibres of woollen of a peculiar dark dye, resembling the fibres taken from a coat worn by the prisoner.

Cerebral Matter.—Under severe injuries to the head, a portion of the brain may escape and be deposited with blood on weapons or elsewhere. Orfila first directed the attention of medical jurists to this subject, and suggested the application of certain chemical tests to the dried spots of brain matter ("Ann. d'Hyg.," 1850, 2, 143). These experiments are not reliable.

If an examination of stains of supposed cerebral matter were required in practice, the application of the microscope by a competent observer, using a power of from 500 to 600 diameters, would be preferable to the chemical methods. In a case of murder which occurred some years since, in which the deceased had sustained severe injuries to the head, an expert professed to have discovered with the stains of blood on cloth a quantity of brain substance; but on

the post-mortem examination of the body it was found that, although there was fracture of the skull, the cavity had not been opened, and no brain had escaped.

10. Evidence Derivable from an Examination of the Assailant.

Marks of Blood or Wounds on the Assailant.—It is a very common, but erroneous idea, that no person can commit a murder in which blood is effused without having his person and clothes more or less covered with blood. On several occasions articles of clothing have been examined which have been worn by persons subsequently convicted of murder by wounding, and either no blood has been found on any part of the dress, or only small spots wholly out of proportion to the quantity of blood which must have flowed from the deceased (see *Reg.* v. *Harrington*, Chelmsford Ass., 1852; *Reg.* v. *Flack*, Ipswich Ass., 1853; *Reg.* v. *Cass*, Carlisle Ass., 1860; *Reg.* v. *Rowlands*, Beaumaris Ass., 1861; *Reg.* v. *Edmonds*, Swansea Ass., 1862). In the case of Gardner (C. C. C., 1862), in which there had been a large effusion of blood from a severe wound in the throat, no bloodstains were found on the clothing of the man who was convicted of the murder. It is obvious that the throat of a person while standing, sitting, or kneeling may be cut by a murderer from behind, and thus in appearance simulate suicide. Under these circumstances the clothes of the assassin would escape being stained with blood. The flowing or spurting of blood upon his clothes will depend upon his position in relation to the deceased at the time of inflicting the wound, and this must always be a matter of pure speculation. In entire violation of this simple principle, the fact of a prisoner's clothes not being marked with blood has been on more than one occasion urged as a proof of his innocence (*Reg.* v. *Dalmas*, C. C. C., June, 1844).

In this case the counsel for the prisoner wished to impress the jury that no person could cut the throat of another without having his clothes covered with blood; and as it was not proved that there was any blood on the clothes, the prisoner could not have been guilty of the crime. The throat of the woman was cut while she was walking across Battersea Bridge, the prisoner having inflicted the wound from behind. In the case of Lord W. Russell, the act of murder was committed by Courvoisier while in a state of nudity. In *Reg.* v. *Müller* (C. C. C., October, 1864) this line of defence was carried to a still greater length. Although the clothes of the prisoner were not produced, and the evidence showed that he had had time to change them, the counsel for the defence said, "Blood spurted out from the deceased, and there is no doubt his assailant, whoever he was, must have been covered with blood, or have been considerably stained with it. It should be observed, however, that the wounds were of a contused character, from which much blood was not likely to have flowed at the time of their infliction.

The clothes worn by the assailant need not, therefore, from this state of facts, have been "covered with blood," or "considerably stained." No artery was cut through, and there was no evidence of spurting. Setting aside these erroneous assumptions, the evidence tended to show that had blood fallen upon his clothes, the prisoner had had ample time to dispose of them, and thus prevent a chemical examination of them. In one case (*Reg.* v. *Smith*, Liverpool Aut. Ass., 1867), too great a reliance upon the absence of bloodstains on the dress of the accused, as adverse to the theory of guilt, appears to have led to a failure of justice.

The deceased was found with his throat cut. The wounds in the throat were of such a nature that they could not have been inflicted by the deceased himself, and might have been made by another person from behind. The accused was traced to the spot, and a cap belonging to him, and saturated with blood, was found under the dying man. In his charge to the jury the judge is reported to have said: "There were very slight, if any, traces of blood upon his clothes, and it appeared to him impossible that the person who committed this deed should not have been deluged with blood from the wound," etc. The medical evidence was to the effect that there were some stains of blood on the clothes, which were damp. They had been washed. The jury acquitted the prisoner. In another case, commonly known as the Eltham murder case (*Reg.* v. *Pook*, C. C. C., July, 1871) a young woman was found dead with severe injury about her head inflicted with a plasterer's hammer. One of the wounds divided the temporal artery. The prisoner's clothes were examined by Letheby, and he found upon them numerous small spots of blood, apparently recent. The judge, in charging the jury, said: "Was it likely that the person who inflicted all that violence, dividing arteries as he did in some places, could have done it without considerable marks of blood being afterwards found upon his clothes?"

This question, if addressed to a medical witness who had had experience in examining such cases, would have been answered in a very different manner from that suggested. The spots were such as might have arisen from the use of a plasterer's hammer in inflicting these wounds. The effect of spurting on the clothes by the divided temporal artery would have depended on the position of the assailant at the time. By a bruising instrument of this kind "considerable marks of blood" were not likely to have been produced. In a trial in Ireland, in 1872, the non-discovery of blood on the clothes of the accused was advanced as a strong proof that he could not have committed the act of murder with which he was charged. There is no doubt that policemen are often misled in searching for criminals by relying upon blood on clothing as a necessary accompaniment of an act of murder. This also leads them to magnify stains of red paint, iron rust, and fruit stains, on the dress of an accused person, into marks of blood.

The presence of spots of blood on articles of clothing, knives, etc., taken from the persons of those who are accused of murder, may be quite consistent with innocence. Small spots or stains have often an undue importance attached to them. Minute spots of blood on the shirt of a man tried for murder by wounding have been regarded as furnishing proof of criminality, until it was explained that they were probably derived from flea-bites, and that some were on one side and some on the other, showing that the shirt had been worn on the two sides. The coarse clothing worn by labourers may acquire blood-spots from a variety of accidental circumstances which the accused may not always be able to explain. When an attempt has been made to wash out the stains, or the accused admits that they are there, and shows great anxiety to give some explanation of their presence, as that he has assisted in killing a pig, rabbits, or rats, or that he was carrying game about him, there may be some ground for suspicion. Due allowance should always be made for the accidental presence of blood.

In *Reg.* v. *Cass* (Carlisle Sum. Ass., 1860), among twelve different articles sent for examination for blood was a sovereign, which it was supposed had been taken from a purse belonging to the deceased at the time of the murder and had been touched by a bloody hand. Although the reddish-coloured spot, which was in the letters near the rim, presented the appearance of dried blood, yet a chemical examination showed that it was not blood.

A few days after, a number of sovereigns received from a public bank were examined. Some of these presented spots similar to that on the sovereign above-mentioned, and one among them had a spot of dried blood upon it. A knife, coin, or purse, handled with a cut finger might be thus, when found in the possession of an accused person, inadvertently set down as a proof of guilt.

If no blood is found on the clothing of a person charged with murder, any wounds or marks of violence upon him should be specially examined. These may have been produced in a struggle with the deceased, and the accused may not be able to give any consistent account of the time or mode of their production. A case has been related (p. 428) in which the identity of an assailant was in some manner established by the form of an ecchymosis on his face. So a wound may be found on the accused which he may pretend to account for by some accident, or in order to evade suspicion. His statement may, however, be wholly irreconcilable with the appearances of the injury. The kind of weapon used, and the period at which it was inflicted, may sometimes be inferred from a simple examination and prove that the prisoner's story is false. A case of this kind was tried, in which an assailant was identified by the peculiarity of a wound on the knee.

He had broken into a house at night with some others, and discharged his gun at the prosecutrix, while he was in the act of kneeling or stooping. The gun burst, and the recoil of the breech produced a mixed laceration and contused wound on the knee of the assailant. When the prisoner was called upon to account for this wound, he referred it to an accidental blow from a mandril some time before. The appearance of the injury was, however, inconsistent both with the time of its alleged accidental infliction and with the instrument said to have produced it; while, on the other hand, it was proved to correspond with such an injury as the broken breech of the gun would have produced at the date of the burglary.

This led to the identification of the prisoner, and his subsequent conviction.

In 1834 two men were charged with having assaulted, with intent to rob, a surgeon.

It appears that the prosecutor, while walking late at night along a lonely road in the country, overtook three men who were strangers to him. One knocked him down by a severe blow on the face and held him, while another put his hand upon his mouth to prevent him giving alarm. The prisoner contrived to get his finger into the prosecutor's mouth, and during the struggle the latter bit off the end completely between the nail and the first joint. The men then ran away. The piece of finger was given to a constable, and in the course of about eight hours he found one of the prisoners with his hand bandaged. On examining the hand, it was ascertained that the tip of one finger was missing. The prisoner accounted for this by saying that he accidentally cut it off. This statement was found to be false, and he made several other inconsistent statements. On comparing the piece of finger with the injured finger of the prisoner's hand, they were found closely to correspond. The portion of finger was preserved in alcohol for the trial, and upon this clear evidence of identity he and his companions were convicted.

These cases may be taken as types of many others of a similar description.

On May 6th, 1904, at Farnham, a youth of eighteen, named Fry, was charged with the murder of a man in a hop-garden; circumstantial

evidence could alone be produced, part of which was some stains on his clothing. These stains prisoner alleged were due to red paint, but they were proved to be blood. Accused's nose bled on Sunday evening, and it was conceivable that his clothes were stained in consequence. It was curious that he should have accounted for the stains by referring to the red paint, which did not cause them. Bloodstains had been found on Fry's knife, and the blade showed signs of recent cleaning. The victim had had his throat cut and skull fractured. Despite these discrepancies, the prisoner was discharged.

In connection with the question of accident, suicide, or homicide, the following cases are of interest as illustrations of points that may arise.

In March, 1904, Mr. Bate, coroner, was engaged two days investigating the circumstances attending the death of David Wright, aged eighty-three, a retired grocer, living at Whitby, near Chester. Deceased, it appeared, died from a wound in the throat. On the Friday previous to his death he had made a will in favour of his wife, and had requested her to get his money out of the bank, and also obtain some papers from his solicitors. The widow, who was the principal witness, said she was in the house when her son called her attention to blood upon deceased's fingers. She thereupon saw a wound in his throat, from which blood was flowing. Having bound his neck with a cloth, she rushed into a neighbour's house and summoned a doctor. Cross-examined by the deputy-chief constable as to the circumstance that deceased inflicted a wound two inches deep while she and the son were in the same apartment, only a few yards away, witness said she had her back turned at the time, and deceased had turned away from her. Questioned as to the cashing of a cheque at the time of her husband's death, she said she signed the deceased's name, but he held the pen. The bank manager had refused to cash it. The medical witnesses stated that the knife was held in the deceased's hand very lightly. They were of opinion that the wound could have been self-inflicted. The coroner said the jury could dismiss from their minds any idea of murder, because there was no evidence against any person.

On the evidence here produced, the editor would say that suspicion might easily attach to the widow.

In the following, the tying of the limbs, amongst other items of evidence, clearly proved murder.

The inquest on the murdered girl, Elizabeth Mary Lynas, belonging to Guisborough, was concluded on January 5th, 1904, at Guisborough Town Hall. The accused man, James Clarkson, was unrepresented, and he had declined to attend the inquest. Sergeant Lambert said that the body was found near a hedge in a direct line with the back of Bennison Street, in which she lived. Her hands were tied with the rope produced. Her feet also were tied together, and the rope went three times round the waist. The throat was deeply cut, and a piece of rag tied round it. The footprints near the body were covered up. The back-door catch of No. 9, Bennison Street showed signs of bloodstains. James Clarkson lived in that house with his father. At one o'clock the witness saw the prisoner in the house in his shirt, on which were several spots of blood. There was blood on his hands also, and the forefinger of each hand had been newly cut. Prisoner explained that he cut his finger with his pocket knife. The kitchen towel was smeared with blood. Witness found in the kitchen a bloodstained razor. It looked as if it had been newly cleaned. He also found a piece of rag corresponding with the piece round the girl's neck. Prisoner's trousers and waistcoat were bloodstained. When charged with the murder prisoner made no reply. In a subsequent search, witness found deceased's Tam-o'-Shanter hat, with blood upon it, on a shelf in the coal-house at prisoner's residence. Samuel Clarkson said when he returned home on the night in question, at twenty minutes past nine, his son was in the house. The razor produced belonged to him, and he last saw it on Christmas Day. The jury returned a verdict of wilful murder against James Clarkson.

WOUNDS OF SPECIAL REGIONS.

Some of the foregoing general principles affecting wounds must now be considered as they apply to special regions of the body.

Wounds of the Head.

Incised wounds, affecting the scalp, unless of great extent, rarely produce any serious effects. When the wound is contused, or accompanied by much laceration of the skin, it is dangerous in consequence of the tendency which the inflammatory process has to assume an erysipelatous character. The results of these wounds are, however, such as to set all general rules of prognosis at defiance. Slight punctured wounds will sometimes terminate fatally in consequence of inflammation, followed by excessive suppuration; while, on the other hand, a man may recover from a lacerated wound by which the greater part of the skin may have been stripped from the bone. The one great danger in scalp wounds is the difficulty of (surgically) cleansing them. This means that suppuration is a possible consequence, and it may very easily extend to the meninges and brain, first, on account of the close proximity of them to the wound; and, secondly, the free vascular connection between structures inside and outside the cranium. Bad treatment may likewise lead to a fatal result from a wound not serious in the first instance, but the question how far the responsibility of an aggressor would be affected by a circumstance of this nature has been already considered (*ante*). Wounds of the head are dangerous in proportion as they affect the brain; and it is rare that a severe contused wound is unaccompanied by some injury to this organ. There is, however, a difficulty which a practitioner has here to contend with—namely, that it is scarcely possible to predict, from *external* appearances, the degree of mischief which has been produced within. The slightest contusions may be attended with fatal consequences, while fractures, accompanied by great depression of bone, and an absolute loss of substance of the brain, are often followed by perfect recovery. Another difficulty in the way of forming a correct opinion consists in the fact, that a person may recover from the first effects of an injury, but after some days or weeks he will suddenly die; and on examination of the body, the greater part of the brain will be found destroyed by suppuration, although no symptoms of mischief may have manifested themselves until within a few hours of death. The abscess in the brain must be directly traceable to the violence inflicted. In some cases it may be formed independently of such violence (*vide* works on Surgery and Pathology).

Concussion.—The anatomical substratum of this, so far as it offers any visible alteration, is bruising of the brain; but it is important to remember that neither compression nor obvious physical injury to the brain is necessary to render concussion fatal. This may be entirely dependent on shock to the nervous system. After death, no particular morbid change may be discovered in the body, or there may be merely the mark of a slight bruise on the head.

In *Reg.* v. *Burgess* (Liverpool Lent Ass., 1845), the deceased, who was the subject of violence, fell and died on the spot, and there was no appearance of injury externally or internally.

The state of insensibility observed in concussion may be only apparent. Some consciousness may be retained. Concussion is usually indicated by fainting, insensibility, or sudden death occurring immediately after the application of external violence. In concussion the symptoms come on *at once*, and the patient sometimes dies without any tendency to reaction manifesting itself. In the most severe form, the person drops at the very moment when struck, and dies on the spot. In other cases, he may linger in a state of insensibility for several days or weeks, and then die. On recovery from concussion there is generally more or less vomiting.

Inflammation may follow the primary shock from concussion—suppuration may take place, and the patient die after the lapse of several weeks, or even months (see cases, *Med. Times and Gaz.*, 1860, 1, p. 645). It is important in a medico-legal point of view to notice that a person may move about and occupy himself, while apparently convalescent, for a week or ten days after recovery from the first shock, and then suddenly be seized with fatal symptoms, and die. This apparent recovery leads to the common supposition that death must have been produced by some intervening cause, and not by the original violence to the head—a point generally urged in the defence of such cases (see *Reg.* v. *Kelpen*, Lewes Sum. Ass., 1871). When the inflammation that follows concussion is of a chronic character, the person may suffer from pain in the head and vomiting, and die after the lapse of weeks, months, or even years (see Rawling, "Hunt. Lect.," *Lancet*, 1, 1904). Concussion may sometimes take place as a consequence of a violent fall on the feet, in which case the head receives a shock through the medium of the spinal column. The skull may be thereby extensively fractured at the base, and the brain may be even shattered by such a fall.

In *Allen* v. *The Chester Railway Company* (Court of Common Pleas, February, 1857) the plaintiff claimed damages for an injury caused by a railway collision. The evidence showed that the plaintiff received a blow on the head. There were no immediate effects; but in two days he suffered from lightness of the head and other symptoms, attributed by his medical attendant to *concussion* of the brain, as a result of the accident. Subsequently there were symptoms of injury to the spine. There was pain in the course of the spine, and partial paralysis of the bladder, rectum, and lower extremities, with loss of memory. The medical witnesses for the plaintiff attributed these symptoms to a blow received by him at the base of the skull. The defendant contended that if these were the results of concussion of the brain, they ought to have manifested themselves immediately on the occurrence of the accident; and this view was to some extent supported by the evidence of experienced surgeons. In substance, however, the medical evidence of the two sides was not conflicting. Concussion of the brain, as it is ordinarily known to surgeons, is generally attended with some *immediate* symptoms; but the witnesses for the defence properly admitted that "a concussion of the brain (and spine?), attended with apparently slight symptoms at first, might, under peculiar circumstances, be followed by serious symptoms." As no other cause could be assigned for the symptoms, this was practically admitting that the plaintiff had suffered from the injury, the degree being simply a question for the jury. They returned a verdict for the plaintiff.

Concussion distinguished from Intoxication.—The symptoms under which a wounded person is labouring may be sometimes attributed to *alcoholic intoxication*, and a medical witness may be asked what difference exists between this state and that of concussion. The history of the case will, in general, suffice to establish a distinction, but

this cannot always be obtained. It is commonly said that the odour of the breath will enable a surgeon to detect intoxication; but it is obvious that a man may meet with concussion after having drunk liquor insufficient to cause intoxication, or concussion may take place while he is intoxicated—a combination which frequently occurs. Under such circumstances we must wait for time to develop the real nature of the case. Concussion may be so slight as sometimes closely to resemble intoxication, and from the absence of all marks of violence to the head and the existence of a spirituous odour in the breath, the medical examiner might be easily deceived. If there be no perceptible odour in the breath, the presumption is that the symptoms are *not* due to intoxication. On the other hand, intoxication may be so great as to give rise to the apprehension of fatal consequences, and the co-existence of a mark of violence on the head might lead to error in the formation of an opinion.

There is nothing in the state of the brain in a dead body, which will enable a practitioner to distinguish whether concussion or intoxication had existed and had been the cause of the symptoms. The vessels may be congested in both cases. The discovery of alcoholic liquid in the stomach may lead to a presumption that deceased had been intoxicated, while marks of violence on the head may favour the view that he had suffered from concussion. When both conditions are found, the examination of the body cannot lead to a solution of the question. The answer must then depend on the special circumstances proved, and, if procurable, on the nature of the symptoms preceding death.

It is to be feared that medical witnesses are not sufficiently careful on these occasions to determine whether there are signs of intoxication about an injured person. Subsequent proceedings may render this a material part of the inquiry. Many a house-surgeon of a hospital has been severely blamed for an omission to inquire and satisfy himself whether, in addition to the results of violence, a man who has been brought into hospital has or has not been intoxicated when admitted. The question is of importance; the injuries to the head may have arisen from a fall, and a drunken man may readily meet with such injuries from accident. There can be no excuse for not making a full inquiry into the precise condition of an injured person, and arriving at the best judgment of which the case admits. A state of intoxication often renders it difficult to form an accurate opinion in a case of alleged criminal wounding; but it is always in the power of a witness to satisfy himself by close examination, the use of the stomach-pump, or simply watching the patient, whether he is in a state of drunkenness or whether he is labouring under the effects of disease or violence. In several instances within a recent period persons who have been struck with incipient symptoms of apoplexy in the streets have been seized and locked up as drunk, and have soon afterwards been found dead or dying. Others, who have suffered from violence, have perished from neglect under a similar mistake made by a medical man or by the police. Disease of the brain, as well as injuries to the brain from violence, may give to a man a staggering gait and render him helpless: they are also commonly accompanied by stupefaction and vomiting. If it should happen that shortly before such an attack, the person has

taken beer, wine, or spirits, sufficient to give an alcoholic odour either to the breath or the matter vomited, it is at once treated as a case of drunkenness, and the unfortunate person is left to his fate.

Intracranial Hæmorrhage.—Violence or Disease?—Blood may be found effused in various situations within the interior of the skull, and the cause of effusion may be either disease or violence. The skill of a medical jurist is often required to determine which of these causes is the more probable, as where, for instance, a pugilist has died after having received severe injuries to the head, and his adversary is tried on a charge of manslaughter. On these occasions it is often urged in the defence, that the bleeding might have arisen either from a diseased state of the vessels of the brain, or—if the evidence render it probable that the blow was the cause—that the effects of the blow were aggravated by a diseased condition of the vessels, or by the excitement into which the deceased was thrown, either from the effects of intoxication or passion. The difficulties are considerably increased when no history of the case is forthcoming, as when a man is simply found dead in a room or elsewhere, and autopsy reveals an intracranial hæmorrhage as the cause of death.

The first point to which attention must be drawn is the exact situation of the hæmorrhage. It may be—

1. Between the bone and the dura mater.
2. Subdural in the arachnoid space.
3. Subpial, or between the pia mater and the brain substance.
4. In the substance of the brain matter itself.

And, again, any of these may be towards the vertex of the brain, or they may be at the base, and they may or may not be associated with bruises of the brain, *i.e.*, with small foci of capillary hæmorrhage.

The next point calling for very close investigation, is the condition, as regards disease, of the arteries at the base of the brain and all the main branches, which, in a case presenting doubtful features, should be carefully cut open to investigate the inner coats.

That, in addition to these points, the pathologist should most carefully look for all signs of violence externally, is too obvious to need more than mention.

Such are the facts observable from which the medical jurist will have to form his theoretical conclusions. In the vast majority—probably 95 per cent.—of all cases there is no difficulty at all in arriving at very definite conclusions; but in the remaining small number of cases the *pros* and *cons.* are very evenly balanced, and the medical witness is compelled to leave matters in doubt, a doubt of which the prisoner will very likely receive the benefit, but this must not influence the medical evidence. The medical witness must remember that it is not his special business to obtain a verdict, but to give what evidence he can fairly do, and leave the result to the jury. Meantime, as the result of experience, the following propositions are definitely warranted as representing facts:—

1. That bruises of the brain (smallish capillary oozings, without a very definite, easily observable, blood-clot) are never found as the result of disease only, except when the disease causing them is abundantly manifest from evidence derivable from autopsy, *e.g.*, scurvy, purpura, cirrhotic kidneys, hæmophilia, atheroma of arteries.

2. That a definite hæmorrhage (with evident clot) in the substance of the brain, or in the ventricles, is never the result of violence *only*, unless the violence has been sufficiently severe to leave manifest evidence of its infliction, but it is a very frequent result of disease alone, or of disease *plus* excitement.

3. That the younger the patient, and the less inclined to intemperance, the rarer it is to find definite hæmorrhage or capillary oozing in the substance of the brain without evident violence; but even in young subjects they may occur at times, *e.g.*, from violent cough, as in pertussis, or for no special cause. They are not very uncommon in newborn children, as the result of difficult labour (*vide* "Infanticide").

4. That meningeal hæmorrhages are far and away more commonly the result of injury than of disease, but that they do occur occasionally from disease. *Pachymeningitis hæmorrhagica* is the only disease of the meninges (as opposed to disease of vessels only) which can cause a copious subdural hæmorrhage. Of this disease, two cases have come under the editor's personal experience in the post-mortem room at the London Hospital. In one the effusion of blood was subpial, and the cortex of the brain was obviously diseased; in the other there had been a large effusion into the arachnoid, which, without the clinical history, he would have asserted to be due to violence (London Hospital Post-Mortem Reports, 1900 (136) and 1903 (1057)).

That a meningeal hæmorrhage from violence is always found, either immediately under the spot struck, or at the opposite side of the skull by *contre-coup*, or at some point in an extension of the fracture caused by the violence. When under the spot struck there is sure to be either a superficial bruise of the scalp, indicating the spot, or a depressed fracture of the bones (the inner table at any rate), or a very definite tear in the vessel causing the bleeding (usually the middle meningeal artery, or one of the sinuses of the brain running in the meninges). When from *contre-coup* there is sure to be either a fracture of the bone or a bruise of the brain from the same cause.

That when a cerebral hæmorrhage, no matter what its extent nor seat, is associated with a fractured skull, the presumption that it was due to violence is practically overwhelming.

When, besides this, there is no remarkable congestion of the brain in other spots, the substance of the organ is firm, and the vessels are to all appearance free from disease, we have the strongest reason to believe that the effusion must have been due to violence, and to no other cause whatever.

When there is evidence of great violence having been sustained by the victim, such as of his having received a violent blow with a bludgeon sufficient to have killed a vigorous man, or of his having been thrown with considerable force with his head against a stone floor, an unqualified admission is often made that excitement alone, or drunkenness alone, would account for the extravasation without reference to the blow. In putting the most favourable construction upon these cases, when we have clear evidence of great violence having been used to the head, with the presence of the usual post-mortem appearances, our opinion should be that the excitement or drunkenness might have predisposed to, but was not the immediate cause of, the cerebral hæmorrhage, even if there be abundant evidence of

disease of the vessels. When the evidence of violence, whether by witnesses or from autopsy, is very slight, then evidence of disease must be allowed greater weight, but it must not be assumed too hastily that death was due to disease only.

In the case of a woman who died in a London hospital in 1857, there was no fracture of the skull or external injury to account for effusion of blood on the brain. The brain was not injured, and in fact there was no apparent cause of death but the effusion, and this was somewhat precipitately assigned to disease. A certificate of death from "apoplexy" was given, and the deceased was buried. It subsequently transpired that she had been maltreated by her husband, and that the effusion of blood was owing to this maltreatment. The condition of the effused blood should be accurately noticed, in order to determine whether it presents any marks indicative of its being recent or of old standing.

On the other hand, the following case occurred in February, 1904 :—

Mr. Wynne Baxter held an inquest on the body of Annie Bunyard, æt. 26. William Clay, a tailor, said he was to have married deceased on Monday. They went to Shoreditch on Friday and purchased one or two things for the home. Early on Sunday morning, when she left the house in a temper, he followed her, and he saw her fall suddenly in Coventry Street. She was taken to the hospital, where she died. She seemed to take very much to heart the circumstance that she could not afford to buy a wedding dress, but had said to him, "Never mind, Bill; I'll get married as I am." Post mortem an ordinary cerebral hæmorrhage in the substance of the brain was found as the cause of death (London Hospital Post-mortem Records, February, 1904).

In *Reg.* v. *Portbury* (C. C. C., March, 1872) a woman was charged with the murder of her mother. The woman died ten days after a quarrel with the prisoner. On inspection there was congestion of the membranes of the brain, with slight effusion. There was nothing to indicate that this had been caused by violence, and the effusion, which was the cause of death, might have arisen from excitement, considering the age and habits of the deceased. This view was adopted by the jury, and the prisoner was discharged. A case occurred in London in 1865 of a similar kind, but death was more rapid. The deceased, æt. 55, had presided at a meeting, and was engaged in an angry altercation, when he received a sharp blow on the cheek. He leaned over on his right side, but did not speak. He died in ten minutes. Both the deceased and the assailant were greatly excited. On inspection blood was found effused on the brain. The medical man properly referred death to apoplexy, as the result of excitement, and not of the blow which was struck. In the trial of Baker for the murder of Casey (*Reg.* v. *Baker*, C. C. C., May, 1882), several interesting points arose with respect to wounds and the cause of death. There were altogether nineteen wounds upon the body of the deceased. Three of these were mortal wounds, viz., one on the left side of the chest, penetrating the right ventricle of the heart, the bag of the heart being filled with blood; a second wound at the lower part of the right side of the chest passed through the liver into the inferior vena cava, and had caused copious hæmorrhage; a third wound had opened the left internal jugular vein. The other wounds were of a minor character. All must have been produced by some sharp instrument. There were also abrasions on the head, neck, hands, etc., made during life. There was no existing disease. Over the surface of the brain was a considerable effusion of blood extending into the ventricles.

This was ascribed by Pepper to apoplexy, probably the result of a violent struggle; and he assigned apoplexy rather than the mortal wounds on the body as the cause of death. Considering the copious hæmorrhage from the mortal wounds, hæmorrhage which probably went on for some time after death, the presence of an effusion of blood upon the brain was remarkable. Probably the mortal wounds were inflicted after the apoplectic seizure, and whilst the man was in the act of dying.

Thus if a man, excited by passion and intoxication, is struck on

the head, and the blow is slight—such as an unaffected person would probably have sustained without injury—yet in this case insensibility and death follow, and on examination a quantity of blood is found effused in the substance of the brain, can it be a matter of doubt, medically speaking, that the effusion was chiefly due to the excitement under which the deceased was labouring? To take a converse instance, a man engaged in a personal conflict with another is struck most violently on the head, or falls with great force on that part of his body; on inspection it is found that death has arisen from effusion of blood on the surface of the brain, and it would be no unexpected consequence of the violence inflicted that a similar appearance should be met with in an individual calm and unexcited. Could a practitioner hesitate to say, under these circumstances, that the blow would satisfactorily account for the effusion, without reference to any co-existing causes of excitement? These may be allowed to have their influence in giving an increased tendency to cerebral hæmorrhage, or in aggravating the consequences of the blow, but no further.

A witness asserts, perhaps, that the extravasation of blood was owing to a blow inflicted on the head. He is then asked whether vessels may not be ruptured by excitement. He answers, without any qualification, in the affirmative, and thus produces an impression on the minds of the jury that excitement may have caused the rupture of the vessel in the particular case on which he is being examined. This impression on the court is not always removed even by a careful re-examination. A medical witness has to state the *whole* truth. A qualified answer should be given to what is really a general question; and supposing his opinion to be already formed on the subject on which his evidence is required, he should not, unless it be strictly consistent with his own views, allow his answer to a *general* question to be made applicable to a *particular* case. If asked whether vessels might not be ruptured and blood extravasated by mere *excitement*, he should answer that such an effect might undoubtedly follow, but that it was his opinion—and it is here supposed that his opinion has been founded upon a deliberate examination of all the *medical* facts—that excitement was not the cause of rupture and extravasation in the case in question. A witness has a right to insist that his evidence shall pass to the jury without having any designed ambiguity attached to it. In a trial for manslaughter it was proved that the prisoner and deceased had been wrestling. The prisoner had thrown the deceased with his head on a stone floor; he then seized him by the throat, and beat his head several times against the floor. The deceased died nineteen hours afterwards. On inspecting the body a great quantity of coagulated blood was found beneath the scalp. There was a wound over the right parietal bone, an inch and a half in length, penetrating through the scalp, but no fracture of the skull. There was a quantity of extravasated blood on the opposite or left side of the head, and a rupture of some branches of the carotid artery on the inside of the skull. On the neck were two discolorations to the left of the windpipe, apparently occasioned by the pressure of two fingers. The laying hold of the neck might, in the opinion of the witness, have more readily caused a rupture of the cerebral vessels by preventing the return of blood. The surgeon, after giving this description of the

post-mortem appearances, was asked whether, in his opinion, death was occasioned by the injury proved in evidence. Death might or might not have been occasioned by it. It might have arisen from other causes, such as an apoplectic fit. The effusion of blood was the immediate cause of death, and he had seen blood in the heads of many persons dying from apoplexy. He was not able to speak to the cause of the rupture of the vessels. He thought it highly probable that the injury received was the cause of death; it was certainly sufficient to account for it (*Med. Gaz.*, vol. 7, p. 382).

A case was tried (Gloucester Sum. Ass., 1845, *Reg.* v. *Phipps*) in which a strong opinion was expressed by Patteson, J., in relation to this defence.

During a fight the prisoner struck the deceased a severe blow under the left ear. He fell, and died in a few minutes. After death blood was found extravasated on the part corresponding to the seat of violence, and this, in the opinion of the medical witness, satisfactorily accounted for death.

The defence was, that the effusion might have proceeded from over-excitement; but the judge said that if it were proved two people were fighting together, blows were struck, one fell to the ground and died, and afterwards internal injuries were found corresponding with the external marks of violence, no power on earth could persuade him that such blows were not the cause of death. The prisoner was found guilty.

Admitting that blood has been effused on the brain as a result of violence, the person injured may survive the effects for so long a period as to create a doubt whether death can be strictly assigned to the violence. In this respect the case of *Reg.* v. *Sullivan* (C. C. C., September, 1853) is of some interest:—

A healthy man was knocked down by the prisoner, and fell with his head upon the ground. He appeared as if he was stunned, staggered in attempting to walk, and complained of pain in the head and general weakness. This was on April 11th, 1853. Although he suffered from pain in the head, he had no medical advice until May 12th, and had in the meantime performed his duties. After this he suffered from dimness of sight, and became delirious. On the 29th he came under the care of M'William. There were marks of bruises on the head, impairment of vision, a faltering gait, and other symptoms indicative of disease of the brain. He improved under treatment, but the symptoms returned in an aggravated form about June 12th, and he became insane. He had delusions, and was evidently suffering from pressure on the brain. He recovered so far that he was about to be discharged, when the symptoms became aggravated, and death took place *four months* after the infliction of the violence. On inspection a shot was found embedded in the frontal bone, not penetrating the skull. A clot of blood amounting to two fluid ounces existed between the layers of the arachnoid membrane, occupying the whole surface of the left hemisphere; the clot had evidently been there for some time, because it was partially invested with a false membrane. No large vessel was ruptured; there had probably been an escape of blood at different times, and this would explain the intermittent nature of the symptoms. The surface of the brain had been obviously indented by its pressure. Another clot of old standing was found in the pons Varolii. The witnesses concurred in attributing death to the effusion of blood on the brain, and the effusion to the violence inflicted by the prisoner, although it was admitted to be probable that some additional effusion had taken place just before the last recurrence of symptoms. The prisoner was convicted of manslaughter.

In the *Lancet*, April 30th, 1904, will be found an excellent description of a case of intracranial hæmorrhage fully illustrating the ordinary course of such injuries, with their complications, similar to

the above. The fact that the deceased had been healthy previous to the violence, and that after this he had constantly suffered more or less from symptoms of pressure on the brain, fully justified the medical opinion, in spite of the protracted nature of the case. There was no other cause but the violence to account for the effusion and death.

Such cases nowadays would not present quite so much difficulty, for meningitis or cerebritis with or without hæmorrhage is a well-recognised consequence either of injury to the head or of a foreign body (which a blood clot is) irritating the meninges or cortex of the brain, and either meningitis or cerebritis may kill after a long period of illness or ill-health, possibly with periods of apparent recovery interpolated in the whole history of the case.

In connection with such cases it is rather important for a pathologist to be acquainted with the changes that time produces in effusions of blood within the cranium. *Vide* also Sect. V., where bruises are discussed.

Recent effusions of blood are recognised by their red colour and the consistency and appearance of the clot or coagulum. After some days the clots acquire a chocolate or brown colour, and this passes gradually into an ochreous tint, which may be met with in from twelve to twenty-five days after the violence. Clots of effused blood also undergo changes in structure and consistency; when old they are firmer, and there is much lymph, which is sometimes disposed in membranous layers of a fibrous structure, and these are adherent to the dura mater and the brain. The surface of this organ sometimes presents a mark indicative of pressure.

A woman, æt. 70, threw herself from a window. The fall produced a severe lacerated wound of the scalp, laying bare the skull, and causing a simple fracture of the sternum and tibia. She died thirty-one days after the injury, in a state of exhaustion. On inspection there was a fracture of the left parietal bone, and between the dura mater and inner surface of the skull, near the left temple, there was a layer of coagulated blood, one-sixth of an inch in thickness and about two inches in breadth. In one place the clot had a brownish hue, but the greater part of it was still rather dark-coloured. On the right side there was a similar effusion of coagulated blood, but this was inside the dura mater and on the arachnoid covering of the brain or within the cavity of the arachnoid. This coagulum was everywhere of a *chocolate-brown* colour, showing that the process of absorption was much more advanced than on the left side. A large quantity of coagulated blood had been effused into the cellular tissue near the fracture of the tibia. This was still black, and had the appearance of a recent effusion. A small quantity of black blood was also found near the sternum, which had been fractured. The fractured ends of the bones had been firmly united. There is no doubt that all these effusions had taken place at the same time from the same accident—*i.e.*, thirty-one days before death—yet they presented very different appearances; and but for the facts being known it might have been contended that the effusion on the arachnoid from the great change of colour was of much older date than the others. The difference, however, was probably owing to absorption being more active on the inner surface of the serous membrane than in the other structures in which blood was effused. In estimating time, as indicated by change of colour in the clot, we must therefore always consider the seat of the effusion and the absorbing power of the tissues. Reid also mentions a remarkable case of effusion of serum in the ventricles of the brain in the case of a young man, who died about a week after he had received a blow on the right side of the face. It appeared, however, that he had sustained a severe injury to the head eighteen months before, and certain changes in the brain, as well as the appearance of the effusion, rendered it probable that it was really of old date, and that it had been caused by the first accident, and not by the blow on the face.

When a medical man is required to give an opinion on the *date* of an effusion found on the brain, great caution is required. A surgeon may not be able to fix the precise date, but it may be in his power to say whether the blood has been effused for a few days, weeks, or months. A case was tried (Derby Lent Ass., 1859) in which this question was material.

On January 25th a man was kicked violently on the head by two companions. He was attended by a surgeon for fourteen days, and was then pronounced to be convalescent. Six weeks after the assault the man became seriously ill, and he died in five days. The two men were tried for manslaughter; and at the trial a medical man deposed that the deceased died from the effects of the injuries inflicted by the prisoners on January 25th. The post-mortem appearances were congestion of the brain, with effusion of a large clot of blood on the surface of the left hemisphere, immediately below the situation of the most serious external wound, this clot being surrounded by a considerable quantity of coagulable lymph. The prisoner's counsel then put the question to the witness, "I can produce evidence to show that deceased fell down some steps into a cellar upon his head three weeks before his death. Do you not think it more likely that death was the result of this fall rather than of the beating three weeks prior to the fall?" The surgeon said: "Certainly not," and "There could not have been the effusion of lymph I describe after an accident within so short a space of time as three weeks. There must have been a longer space of time between the injury and the death to have produced this appearance."

The reasons for so strong an opinion were not given. So far as the description goes, there was nothing to show that the effusion had been there more than three weeks. Coagulable lymph may be found in these effusions within a much shorter period than three weeks.

A man fell from a height upon his head, was ill for three days, and then so far recovered that he sat up and dressed himself; on the next day he became insensible, and died on the eighth day after the accident. On inspection the base of the skull, including both orbits, was found fractured; there was effusion with much lymph at the base of the brain. In the case, which was the subject of trial, the situation of the effusion beneath the seat of violence was in favour of its being caused by that violence, but there was nothing in the appearance of the effusion to enable a medical man to say whether it had taken place either six weeks or three weeks before death. The perfect intermediate recovery was somewhat adverse to the theory that the clot was produced by the violence of the prisoners.

In another case, as a result of effusion of blood from injury to the head, death did not take place until the twelfth day. The patient, æt. 18, received a blow on the head during a fight. He did not suffer much in consequence, and continued his employment during the next ten days, but on the eleventh day, owing to his having headache, he went to the hospital. He walked to his bed, and appeared quite rational, but he was depressed, and there were febrile symptoms. He died during the night. On inspection bruises were found on the arms, but the head presented no outward sign of injury, and the bones were not fractured. On removing the outer membrane (dura mater) the right half of the brain was surrounded by effused blood, which had compressed it. It was contained in the cavity of the arachnoid membrane. The brain presented no breach of surface or laceration from which the blood could have issued, and its substance was healthy. Four ounces of blood in a fluid state were collected. There was a loose coagulum of slightly brown hue, and under this there were other coagula of a light ochreous colour adherent to the brain and dura mater, showing that the blood had been effused some days. These coagula were in membranous layers, and under the microscope presented a fibrous texture (Guy's Hosp. Rep., 1859, p. 123). This case shows the insidious nature of injuries to the head, and that an injury may prove fatal without leaving any marks of violence externally, or appearance of laceration of vessels or brain substance internally. A man while intoxicated was thrown down, and struck his head against the pavement. He was taken up

insensible, the wound was dressed, and he partially recovered his senses. Three days afterwards he was brought into Guy's Hospital in a state resembling that of concussion. There was a scalp wound at the back of the head on the left side. He remained in a lethargic state, being occasionally affected with convulsions. About a week after his admission he sank into a half-comatose state, and occasionally screamed out. The pupils became finally contracted (as in narcotic poisoning), and he died twenty-five days after the infliction of the violence. On inspection a layer of blood an inch thick was found covering the right hemisphere of the brain. The clot was thready, of a dull red colour, and in some parts of a yellow or ochreous tint, showing from these changes in the red colouring matter that the blood had been effused for a considerable time. On two portions of the base this yellow clot was closely adherent to the brain, and on removing it this was found to be bruised and softened. The source of the blood was traced to some ruptured vessels of the inner membrane (pia mater) at this spot. None of the larger arteries or venous sinuses were found injured, and there were no inflammatory products (Guy's Hosp. Rep., 1859, p. 122).

In cases of injuries to the head proving fatal by *effusion* of blood on the brain, a person may recover from the first effects of the violence, and apparently be going on well, when he will suddenly become worse and die. Effusion takes place slowly at first: it may be arrested by the effects of stupor from concussion, by a portion of the blood coagulating around the ruptured orifices of the vessels, or by some other mechanical impediment to its escape; but after a longer or shorter period, especially if the person be excited or disturbed, the bleeding will recur and destroy life by producing compression. How many hours or days are required in order that such an increased effusion should take place after an accident it is impossible to say, but in severe cases it is generally observed to follow the injury within a short time.

Astley Cooper has related the case of a gentleman who was thrown out of a chaise, and fell upon his head with such violence as to stun him in the first instance. After a short time he recovered his senses, and felt so much better that he entered the chaise again, and was driven to his father's house by a companion. He attempted to pass off the accident as of a trivial nature, but he soon began to feel heavy and drowsy, so that he was obliged to go to bed. His symptoms became more alarming, and he died in about an hour from effusion of blood on the brain. When the brain has sustained laceration from violence, in addition to insensibility, convulsions are frequently observed.

Wounds of the Brain.

Wounds of the brain sometimes prove instantaneously mortal, even when slight; while in other cases recoveries take place from contused or punctured wounds of this organ contrary to all expectation. When a person survives the first effects of the injury, there are two sources of danger:—

1. Septic inflammation, with its dangers in general.
2. Extension by inflammation of injurious influences to parts of the brain which are immediately concerned in the continuance of life.

Cases such as the following are by no means rare:—

At Newcastle in May, 1904, William Field, a barber, was sentenced to five years' penal servitude for attempting to murder his mother, Ann Field. Accused attacked his mother with a large coal hammer, striking her over the head several times, and nearly killing her. She recovered, and was able to give evidence against her son.

Injury to the Head: Blow or Fall?

This subject has important applications in legal medicine, for there are many cases of this description tried at the assizes. Injury may occur from violence with or without fracture, and it may take place without being accompanied by any external marks of the violence.

It is true that the statute says "by any other means whatsoever cause grievous bodily harm"; but, for all that, when there is evidence simply of a general scuffle, the punishment inflicted is very likely to be very materially influenced by the answer to the question above propounded. Take the following not unusual circumstances:—The deceased is annoying and following the prisoner, the prisoner turns round and pushes (he says), strikes (says the prosecution), the deceased, who falls and dies speedily from head injury. The evidence of a blow or push may be very conflicting, and yet evidently it may be very material indeed to the punishment, if not even to the verdict.

The answer is by no means easy, and in general the medical witness will be compelled to admit that the injury might have arisen from the fall. The following points may, however, help materially to a conclusion:—

1. The nature of the spot of ground upon which the head was alleged to have fallen, soft earth, for instance, *v.* a hard flagstone. If on soft earth, was there a sharp stone or bit of brick or other hard substance with which the head could have come in contact?

2. How did he fall—forwards, backwards, or sideways? Does the locality of the injury on the head correspond either with direct violence, which might have been sustained by a blow either of a fist or weapon, or does it more nearly correspond with the direction of the alleged fall? *Vide* also "Fractured Skull" (below).

3. The number and nature (severity, etc.) of the injuries. If a fight is admitted, many of these may be due to it, but if only one blow, or none, is admitted, then one fall can only account for one injury.

4. The position of the injury. In a simple fall it is almost impossible for the vertex to be injured unless the victim is knocked down when standing about his own height from a wall, and in the fall thus brings the top of his head against the wall.

For other points *vide ante* under the heading "Accident, Suicide, or Homicide?"

Fractures of the Skull.

There are certain points about fractures of the skull with which it is necessary for a medical jurist to be familiar, for they will throw much light on the "Nature of the Weapon," "Accident, Suicide, or Homicide?" "How Inflicted?" etc.

The principal points are here epitomised. For more complete details the reader is referred to Rawlings's Hunterian Lectures in the *Lancet*, vol. 1, 1904.

1. With pointed weapons, or with ones the striking surface of which is small in proportion to the momentum of its impact, such as the blunt end of a hammer, etc.—(*a*) the shape of the depression on the outer surface frequently corresponds pretty closely to the shape of the contact area of the weapon; or (*b*) a local starred fracture is produced, which may or may not extend far beyond the area of depression.

2. In the cases of local fracture the table of the skull which at the moment of impact is farthest from the force is splintered to a larger extent than the table nearer to the force, owing to the fact that it is, *quâ* the force, unsupported. This fact enables us to ascertain the direction in which a solid object has passed through the skull, the fracture of entrance having the inner table, the fracture of exit having the outer table, more extensively splintered. The direction, too, in which the splinters are bent will corroborate the inference.

3. If such a starred local fracture has a limb extending from the locality, such limb will follow the rule in the next paragraph.

4. With forces the contact area of which is broader, falls on the head, crushes of cart wheels, blows of bludgeons, falls on the feet (the condyles being the point of transmission of the force), are the commonly occurring examples, the universal rule is that the line of fracture shall be parallel to the line of direction of the crushing force, most frequently starting from the point of contact. Thus a blow on the side of the head produces a fracture running across the base and over the vertex from side to side. Similarly an antero-posterior fracture, either sagittal or oblique, is produced by a force acting in the sagittal plane or in an oblique one.

5. If the head be supported, and so prevented from moving, the fracture may start at the point of contact of the blow, or at the opposite point where the head was supported; for example, in falls on the vertex the fracture may have begun either at the vertex or at the base.

It is of course obvious that the greater the violence, as in train smashes, or when other very heavy vehicles have caused severe violence, the more difficult it is to actually trace these lines of fracture, but it is equally obvious that there is the less necessity from a medico-legal point of view to do so.

When the force causing the fracture is a broad one it is important to remember that there may be extensive fracture and separation of the bones of the head without any division of the skin.

A blow on the head may produce a fracture of the inner table of the skull, and cause death by compression as a result of the fracture or of the effusion of blood. In *Reg.* v. *Hadwen* (Lancaster Aut. Ass. 1871), the prisoner struck a boy a severe blow on the head. He became sick and unconscious, fell into a state of collapse, and died the next day. On inspection the inner table of the skull was found to be fractured, and there was effusion of blood on the brain.

The orbits are very common situations for small starred fractures of the skull due to direct penetrating violence. A stick, a gimlet, a pair of scissors, a birch broom (points of), a tobacco pipe, a penholder, have all been recorded as producing such fractures. The bone between the orbit and the brain is very thin, and, in young persons especially, very easily perforated. In all cases of fracture the thickness of the skull should be noted, for though it may not, and does not, absolve a prisoner from responsibility, still the fact that the skull was unusually thin will influence the medical jurist's opinion as to the severity of the violence, whether criminal or accidental.

A person is occasionally sensible so long as the foreign substance which produced the fracture and depression remains wedged in the brain, insensibility and other fatal symptoms beginning to manifest

themselves only after its removal. This is not the usual rule, but being admitted, it may be urged in defence that death was really caused by medical interference. It is a sufficient answer to state that the wounded person must have died from inflammation of the brain if the foreign body had been allowed to remain, and that it is consistent with the soundest principles of practice to remove all such foreign substances without delay. In fractures of the skull with depression, it may become a question whether the surgeon raised the depressed portion of bone so soon as he ought to have done. *Vide* "Malpraxis" for further remarks.

Wounds of the Face.

When wounds of the face are of any extent, they are usually followed by great deformity; and when they penetrate the cavities in which the organs of the senses are situated, they often prove fatal, either by involving the brain and its membranes or by giving rise to inflammation of this organ. Wounds of the eyebrows are not of so simple a nature as might at first sight be supposed. Besides being attended with deformity when they heal, they are liable to give rise, during the process of healing, to serious disorders of the neighbouring parts. Amaurosis and neuralgia are recorded among the secondary and not unusual consequences of such wounds when the supra-orbital nerve has become implicated. Under certain conditions of the body there may be inflammation of the parts within the orbit, extending by contiguity to the membranes of the brain, and proving fatal by leading to the formation of pus within that organ. Amaurosis in the right eye has been known to occur from a contused wound, not of a violent nature, to the right eyebrow (*Med. Gaz.*, vol. 31, p. 931). Wounds apparently confined to the external parts of the face frequently conceal deep-seated mischief (*vide* cases *ante*).

Wounds of the Nose.

These wounds are, generally speaking, of a simple nature, rarely giving rise to serious symptoms; but they are often attended with great deformity. If the injury is contused and, at the same time, extensive, a loss of the sense of smelling will probably result. A penetrating wound of the nose, produced by passing a sharp-pointed instrument up the nostril, may destroy life by perforating the cribriform plate of the ethmoid bone and injuring the brain. Such a wound, it is obvious, might be produced without leaving any external marks of injury. A man died in nine weeks from the effects of a wound of the nose, whereby the nasal bones were fractured. On inspection there was a copious inflammatory effusion at the surface of the brain, particularly at the part corresponding to the seat of the violence. An injury to the bones of the nose may prove fatal by giving rise to an attack of tetanus.

INJURIES TO THE SPINE.

Injuries to the spine and spinal marrow seldom require medico-legal investigation from a criminal point of view, but they are constantly cropping up in civil cases for compensation; this organ is liable to *concussion* from blows, to compression from fracture of the

vertebræ or the effusion of blood, with all the secondary consequences attending such accidents. Concussion of the spinal marrow commonly produces paralysis, affecting the bladder, rectum, or lower extremities. These symptoms may not appear at once, but come on after some hours or days (*Bowling* v. *S.-E. Ry. Co.*, Exch., February, 1859; also *Williamson* v. *L., B., and S.C. Ry. Co.*, Guildford Sum. Ass., 1862). After death no traces of mechanical injury may be discovered. Blows on the spine, unattended with fracture or dislocation, may be followed by inflammation and softening of the spinal marrow. A slight injury has been known to cause death by giving rise to inflammation of the spinal marrow. This organ is also liable to compression from slight causes. A man was tried on a charge of manslaughter. It appeared in evidence that he had thrown the deceased on the ground, and while he was attempting to rise he caught him by the throat, forced him backwards, and brought his head violently in contact with the ground. The deceased died after a few convulsive gasps. On inspection the spinal cord was found to be compressed between the body of the fourth and the arch of the third vertebra, but on removing it no indentation or laceration of its substance was perceptible. Death had ensued from paralysis. This case shows the necessity of inspecting the vertebral column when death is alleged to have been caused by violence, and no traces of it are perceptible in other parts of the body. Indeed, it is not improbable that in many cases of sudden death from alleged or suspected violence, where the cause is obscure, if the spinal marrow were examined, the fatal result might be explained by the discovery of some mechanical injury or morbid change in this organ. This part of a medico-legal inspection is too commonly neglected. (See "Ann. d'Hyg.," 1871, 1, 138, and 2, 116.)

Fractures of the Vertebræ.—These fractures are generally attended by displacement, and thus produce compression of the spinal marrow. They are the more rapidly fatal in proportion as the injury is high up in the vertebral column. The whole of the body becomes paralysed below the seat of injury by the compression of the spinal marrow. If the seat of compression is above the fourth cervical vertebra death is commonly immediate: asphyxia results from paralysis of the nerves which supply the diaphragm, and are necessary to respiration. In falls on the top of the head from a height, it sometimes happens, not only that the skull is extensively fractured, but that the dentiform process of the second vertebra is broken off, owing to the head being doubled under the body. This injury to the second vertebra may be the cause of death. This accident is not always attended with fatal compression of the spinal marrow (*Edin. Med. and Surg. Jour.*, January, 1838, p. 265). In one instance the person survived fifteen months (*ib.*, October, 1845, p. 527); and in another, in which the fracture was caused by the patient turning in bed while his head was pressed on the pillow, death did not take place for *sixteen* months (Copland, "Dict. Pr. Med.," "Paralysis"). On several criminal trials this injury was proved to have been the cause of death; and in a case tried at Glasgow (*Rex* v. *Reid*), it became a material question how far such a fracture might result from disease. It may happen that caries of the bone, or disease of the transverse ligament, will cause a separation of the dentiform process from the second cervical vertebra. The state of the

bone in these alleged fatal accidents should therefore be closely examined. In Reid's case an acquittal took place, partly because the deceased had laboured under disease of the spine, and the exact state of the parts had not been noticed. Disease of the ligaments may also lead to a separation, followed by slow or rapid death, according to the degree of pressure. A slight cause may sometimes produce severe and fatal injury to the neck.

A lunatic in a private asylum suddenly threw her head back, in order to avoid taking some food that was offered to her; and she died evidently from the compression produced by the displacement of the dentiform process of tho second vertebra. A woman died suddenly a month after her confinement; she had been suckling her child at one o'clock in the morning, and at four she was found dead. The viscera of the abdomen, chest, and head were carefully examined without the discovery of any morbid appearance to account for her death, when, as the brain was being returned into the skull, one of the inspectors noticed a projection at the foramen magnum. On further examination the dentiform process of the second vertebra was found to have been displaced, and this had so injured the spinal marrow as to destroy life (*Med. Gaz.*, vol. 3, p. 582).

It is not stated whether the bone was in a healthy or diseased condition. The following case shows that the rapidity of death will depend on the degree of compression:—

A girl had a stiff neck, as it was supposed, from cold; her head was continually twisted to the left side, but she possessed the power of moving it in the opposite direction. While in this state a man suddenly seized her and gave her head a violent twist; she felt immediately severe pain, lost the power of turning her head to the right, and had difficulty of swallowing. These symptoms continued to increase for a month, and she ultimately died from paralysis. On inspection the ligaments of the first and second vertebræ were found ruptured, but there was no mark of suppuration. The bones were healthy. The dentiform process had compressed the anterior columns of the spinal marrow, which were softened. It was observed during life that she had lost more of the power of motion than of sensation (*Gaz. Méd.*, November, 1842).

A displacement of the odontoid process may take place from very slight causes. In a case which occurred to Petit, a child was instantaneously killed in consequence of its having been lifted up by the head. See also Cormack's *Edin. Jour.*, April, 1845, p. 314. A man while holding his head in a butting position during a struggle with a friend died suddenly. The friend had forcibly rotated or twisted the deceased's head a few times from side to side by the brim of his hat. On inspection it was found that the first four cervical vertebræ were fractured—the ligaments were bruised and torn, and blood was effused on the coverings of the spinal cord (*Med. Times and Gaz.*, May 17th, 1856). It is not stated whether there was any disease of the bones. Compression of the spinal marrow sometimes arises, though rarely, from *effusion* of blood from a fall. It is important to remember that an effusion of blood may also take place from spontaneous causes. In one case, which proved fatal from an accidental fall, a coagulum of blood was found effused into the substance of the spinal marrow, exactly opposite a fracture of the body of the sixth cervical vertebra.

Injuries to the spine and its contents are generally the result of falls or blows either on the head or the lower part of the column, or of crushes beneath heavy weights, as in navvies and housebreakers, etc. The secondary consequences of these injuries are sometimes so insidious

as to disarm suspicion, and death may take place quite unexpectedly some weeks after the accident. Splinters of bone, separated by fractures, may remain adherent for some time, and, by a sudden turn of the head, be forced off, and destroy life by penetrating the spinal marrow at a period long after the infliction of the injury. This has been known to happen in fractures involving the margin of the foramen magnum, though in such cases death is usually immediate.

The spinal marrow has been in some instances wounded in its upper part by sharp-pointed instruments introduced between the vertebræ. Death is sometimes an instantaneous result when the wound is above the third cervical vertebra; there is no part of the spine where a weapon can so easily penetrate as this, especially if the neck be slightly bent forward. The external wound thus made may be very small, and if produced with any obliquity by drawing aside the integuments, it might be easily overlooked, or it might be set down as superficial. For an account of a case in which death occurred from a stab in the back of the neck, causing a division of the spinal marrow, see Henke, *Zeitschrift der S. A.*, 1836, H. 2; and for another case of homicidal injury to the spine see *Lancet*, 1855, 1, p. 520. Several such cases may be found in medical journals and works on surgery.

In fractures of the vertebræ, a person is generally so disabled, whatever may be the situation of the fracture, that he cannot walk or exert himself. We must be prepared, however, for exceptions to this.

In 1861, a man, æt. 35, was admitted into the Northampton Infirmary suffering from paralysis of the legs and great pain in the back and in the abdomen. He could give no intelligible account of the cause of his illness. He soon died; and on a post-mortem examination the tenth dorsal vertebra was found broken in its body and arch. There was slight displacement, but it was not such as to press upon the spinal cord. A large clot of blood was situated on the sheath of the cord, and had caused the paralysis. It was proved at the inquest that deceased met with a heavy fall, but that he had walked some distance afterwards, visited several public-houses, gone home intoxicated, and lain down to sleep in a yard. He awoke in the morning sober, but was unable to move his legs. In addition to paralysis, the man when admitted was labouring under peritonitis. There was no evidence that he had sustained any injury subsequently to the fall twelve days before his admission; hence thero was reason to believe that, in spite of the fractured vertebra, he had not been rendered incapable of motion. There is no doubt that the effusion of blood was the cause of the paralysis, and this did not occur until some time after the fracture, as the result of slow oozing. See for a case somewhat similar *Reg.* v. *Slater and Vivian*, C. C. C., September, 1860, "Insanity."

WOUNDS OF THE CHEST.

Wounds of the chest have been divided into those which are confined to the walls and those which penetrate the cavity. Incised or punctured wounds of the chest-walls are rarely followed by dangerous consequences. The bleeding is not considerable, and is generally arrested without much difficulty. They heal either by *primary union* or after suppuration, and unless their effects are aggravated by incidental circumstances, the person recovers. Contusions or contused wounds of the chest are, however, far more dangerous, and the danger is in a ratio to the degree of violence used. Such injuries when severe are ordinarily accompanied by fractures of the ribs or sternum; by a rupture of the viscera within the cavity, including the diaphragm; by profuse bleeding; or, as an after-effect,

by inflammation of the lungs, with or without suppuration and with or without fracture. Fractures of the ribs are dangerous for several reasons: the bones may be splintered and driven inwards, thereby wounding the lungs and causing hæmorrhage or leading to inflammation of the pleura or lungs. In fractures of the upper ribs the prognosis is less favourable than in those of the lower, because commonly a much greater degree of violence is required to produce the fracture. A simple fracture of the sternum or chest-bone without displacement of the bone is rarely attended with danger, unless the concussion has at the same time produced mischief internally, which will be known by the symptoms. When, however, the bone is depressed as well as fractured, the viscera behind may be mortally injured. In a case of depressed fracture of the sternum, the person died after the lapse of thirteen days; and on inspection it was found that the fractured portion of bone had produced a transverse wound of the heart about an inch in length. The cavities of the organ had not been penetrated, but the piece of bone was exactly adapted to the depression produced by it on the parietes (Devergie, "Méd. Lég.," vol. 2, p. 243). A witness will frequently be required to take into consideration the effects of contusions on the chest, with or without fracture, in cases of death from pugilistic combats, which formerly gave rise to numerous trials on charges of manslaughter. Wounds penetrating into the cavity of the chest are generally dangerous, even when slight, in consequence of the numerous accidents with which they are liable to be complicated. In these wounds, the lungs are most commonly injured; but, according to the direction of the weapon, the heart or the great vessels connected with it, as well as the œsophagus (gullet) and the thoracic duct, may share in the mischief.

WOUNDS OF THE LUNGS.

The immediate cause of danger from wounds of these organs is the consequent hæmorrhage, which is profuse in proportion to the depth of the wound and the size of the vessels wounded. Should the weapon divide any of the trunks or main branches of the pulmonary vessels, the individual may speedily sink. The degree of hæmorrhage cannot be determined by the quantity of blood which escapes from the wound; for it may flow internally, and collect within the cavity of the pleura, impeding respiration. This is especially to be apprehended when the external orifice of the wound is small and oblique, and one of the intercostal arteries has been touched by the weapon. A wound of the lung is generally known, among other symptoms, by the frothiness and florid colour of the blood which issues from the orifice, as well as by the expectoration of blood. The lungs may sustain serious injury from a blow or fall, and yet there may be no external marks of violence or symptoms indicative of danger for some hours (*vide* case *ante* of torn lung).

A young man while riding fell from his horse on his left arm. He complained of no pain for five hours, but in twelve hours he was seized with an alarming flow of blood from the mouth. He died in the course of a few days. After death there was no external mark of injury to the chest, but the right lung was ruptured posteriorly throughout its length, and much blood had been effused (*Lancet*, November, 1842).

A boy, aged fourteen, fell to the ground from a height of about twenty feet, and died in about three hours after the accident. On examination of the body there was no mark of external injury. The collar-bone was fractured, but the ribs had escaped injury. The right lung was ruptured to the depth of four inches into its substance, and from this rupture a large quantity of blood had escaped, causing death. This case furnishes another illustration of the production of fatal internal injuries without any corresponding marks of violence externally. For a case of laceration of the lung without fracture of the ribs from a carriage passing over the chest see *Med. Times and Gaz.*, 1861, 1, p. 68. The surgeon should observe whether death, when it occurs during the convalescence of a person who has survived the first effects of a penetrating wound of the chest, may not have been caused either by imprudence on the part of the patient, or by abuse of regimen or other misconduct; for circumstances of this nature may be occasionally treated as mitigatory on the trial of the assailant. It is properly recommended that in all cases where a person is progressing to recovery any alteration in the treatment should be made with great circumspection. A soldier died instantly from internal hæmorrhage, brought on by throwing a bowl at some nine-pins, two months after he had been apparently cured of a wound of the lungs (*Med. Times and Gaz.*, 1851, 2, p. 98).

This giving way of an old healed wound is a well-known occasional accident in any region of the body that can be subjected to a strain.

WOUNDS OF THE HEART.

Wounds of the heart are among the most fatal of penetrating wounds of the chest. It was formerly considered that all wounds of this organ were necessarily and instantly mortal, a view which must now be considerably modified. When the wound is small, and the weapon penetrates into the cavities of the heart obliquely, life may be prolonged for a considerable period; and cases are on record in which it is probable that such wounds would have healed, and the patients have finally recovered, but for the supervention of other diseases which destroyed life.

Dupuytren has reported the case of a man who received a stab on the left side of the chest. He was brought to the Hôtel Dieu, but the symptoms under which he laboured did not lead to the suspicion that he had received a wound of the heart. The man died in eight days, of cerebral disease. On an inspection of his body it was found that the left ventricle was wounded about the middle and a little to the right, its cavity having been penetrated in a transverse direction. The wound was three lines and a half across, and one line from above downwards. The external fibres of the organ were most separated; the openings diminished gradually, so that the internal fibres were in contact and closed the wound. A boy, in pulling a knife from a companion with the point towards him, accidentally stabbed himself in the chest. A small quantity of florid red blood escaped; he vomited, and fell to the ground. He died in eight days. The left ventricle had been perforated, and one pound and a half of blood was effused in the chest. This case shows that fatal hæmorrhage is not always immediate (*Med. Gaz.*, vol. 2, p. 729). In another instance, reported by Dupuytren, five or six wounds were made by means of a saddler's needle, most of them penetrating into the left ventricle of the heart. The man died of cerebral disease twenty-five days after the wounds could have been possibly inflicted; for the needle was taken from him twenty-five days before his death, without any suspicion being entertained of his having wounded himself

with it. The cicatrices were visible on an inspection of the body. The quantity of blood found in the chest amounted to about three ounces, and this appeared to have proceeded from the substance of the heart (*Med. Gaz.*, vol. 13, p. 664). For a case of sudden death as the result of an accidental wound by a fish-bone see *Med. Times and Gaz.*, 1860, 1, p. 467; and for cases in illustration of the fact that wounds of the heart are not instantaneously mortal see *Med. Gaz.*, vol. 2, p. 729.

From a series of cases collected by Ollivier and Sansom it appears that out of twenty-nine instances of penetrating wounds of the heart only two proved fatal within forty-eight hours. In the others death took place at the varied periods of from four to twenty-eight days after the infliction of the wound (Devergie, "Méd. Lég.," vol. 2, p. 253). These differences in the time at which death occurs, as well as the fact that wounds of the heart do not instantly destroy life, have been ascribed to the peculiar disposition of the muscular fibres of the organ, and to the manner in which they are penetrated by a weapon. Thus, as a general principle, it is stated that wounds which are parallel to the axis of the heart are, *cæteris paribus*, less rapidly fatal than those which are transverse to its axis. In a wound which divides the fibres transversely, the opening will be larger, and the hæmorrhage greater, than in one that is parallel to these fibres; and as the heart is composed of different layers, of which the fibres pass in different directions, so in a penetrating wound of its cavities, while one set tends to separate the edges, another tends to bring them together, and thereby to restrain the flow of blood. It is this action of the fibres which renders wounds of the ventricles less rapidly fatal than those of the auricles, all other circumstances being equal.

A man has been known to survive a laceration of the left auricle eleven hours. In this case the chest was crushed, and after death it was found that the left auricle was lacerated to the extent of an inch; nevertheless this patient survived the injury for the long period mentioned (*Lancet*, January 30th, 1841, p. 655). In another instance, where a man was stabbed through the left auricle during a quarrel, death did not take place until after the lapse of seventy-eight hours (*Med. Gaz.*, 40, 520). A case is reported in which a person is stated to have recovered from a punctured wound of the heart (*Med. Gaz.*, vol. 17, p. 82); and Trugien met with a case in which a man who had been stabbed in the left ventricle survived five days. The wound in the heart had partly cicatrised (*ib.*, vol. 47, p. 42).

The presence of a weapon in the wound, by mechanically obstructing the effusion of blood, also retards the fatal result.

A lunatic wounded himself with a very long sharp instrument on the left side of the chest. Two days afterwards he was admitted into the Bicetre Hospital, labouring under oppressed breathing, intermittent pulse, and other serious symptoms. The wounded man stated that he had plunged the instrument into his chest, and had not been able to withdraw it. His symptoms became more aggravated, and he died on the twentieth day after the infliction of the wound. The pericardium and the surrounding parts were found inflamed; and on opening the heart an iron stiletto was discovered, firmly embedded in the substance of the left ventricle, which it had entirely traversed, so that its point projected a few lines into the cavity of the right ventricle. The man had obviously died from effusion of blood; but this had taken place slowly, and only after the period of time mentioned had the bleeding sufficed to destroy life.

It appears that the right cavities of the heart are more frequently wounded than the left, and of these the right ventricle is most commonly the seat of injury. Out of sixty-four cases of wounds of this organ, twenty-nine were situated in the right ventricle, twelve in the left

ventricle, nine in the two ventricles, three in the right auricle, and one in the left auricle. These differences are readily accounted for by the relative situations of the cavities. It appears also that wounds of the right ventricle are not only the most frequent, but of all others they are the most rapidly mortal. It is considered that the suddenness of death in severe wounds of the cavities of this organ is to be ascribed not merely to the loss of blood, but to the degree of compression which the heart experiences from that which escapes into the pericardial sac. A singular case of accidental wound of the heart, causing death, is reported (*Med. Times and Gaz.*, 1860, 1, p. 467). A woman died suddenly under suspicious circumstances. On inspection it was found that a large fish-bone had protruded through the stomach and had perforated the heart, causing death by hæmorrhage. In reference to the *direction* of penetrating wounds of the chest, it may be stated that the base of the heart corresponds to the upper margin of the third rib on the left side, and the apex to the lower margin of the fifth rib on the same side.

Ruptures of the Heart.—The heart is liable to be *ruptured* either from disease or accident. In the latter case, the organ generally gives way towards the base, and through one of its cavities on the right side. For cases see *Med.-Chir. Rev.*, vol. 31, p. 532. Hope asserts that in ruptures from natural causes it is the left side of the heart, and particularly the left ventricle, in which a rupture is most frequently found. The symptoms are sudden pain, collapse, cramps, cold extremities, and rapid death. According to the circumstances under which they occur, cases of rupture from disease may excite a suspicion of death from violence. Sometimes the substance of the heart appears to have undergone fatty degeneration. A case occurred in which, under this diseased condition, the left ventricle had become ruptured during slight muscular exertion (*Med. Gaz.*, vol. 38, pp. 774 and 857) ; and a case is reported of rupture of the right ventricle under similar circumstances (*Lancet*, February 16th, 1857). In other instances there has been no apparent alteration of structure.

A young man, aged twenty-nine, died in ten hours after his first seizure. On inspection there was a small aperture in the right auricle near the vena cava. This did not appear to be connected with any morbid condition of the heart (*Med. Gaz.*, vol. 26, p. 518; *Lancet*, November, 1843). It is worthy of note that when this alarming accident proceeds from blows or falls it is not always accompanied by marks of external violence, or any fracture or other injury to the exterior of the chest. A girl was knocked down and run over by a cart. When brought to the hospital she was dead, and there was no mark of injury upon any part of the body. On inspection the pericardium was found to be full of blood, which had issued from a transverse rent across the apex of the heart. Both ventricles were laid open; the muscular substance was torn to a greater extent than the pericardium. The spine and ribs were unbroken, and there was no injury to any other organ. It was obvious that the injury to the heart had been occasioned by the accident ("Mem. of Path. Soc.," January, 1863). A case is recorded by Gairdner in which a cart-wheel passed over the chest of a child, and occasioned instant death by causing rupture of the heart. Christison met with two similar instances, one caused by a fall, the other by a blow. A child was killed, as was supposed, by the wheel of a carriage going over its chest. On inspection the skin, muscles, and ribs were free from any marks of injury. The pericardium was lacerated, and a pint of blood was effused into the right pleural cavity. The heart was found ruptured throughout its entire length. In another case, a man fell from a cliff the height of one hundred feet. There were a few slight bruises about the body, but no serious wound or fracture. On opening the chest the pericardium was found to be distended with dark fluid blood, which had escaped from an

irregular opening about three-quarters of an inch in diameter, situated in the anterior portion of the right auricle. For another case see "Cyc. Pr. Med.," vol. 4, p. 557. A boy was run over by a heavy waggon, two wheels of which passed over his chest. He arose apparently not much injured, but on reaching the side of the street fell dead. On dissection the heart was found ruptured. The ribs were not fractured, nor was there any laceration of the walls of the chest.

The *natural* causes of rupture of the heart are violent mental emotions, such as anger, fright, terror, paroxysms of passion, sudden or excessive muscular efforts, or violent physical exertions in constrained positions. The heart, like any other muscle, may give way from its own powerful contractions. The left auricle of the heart has been ruptured as a result of great physical exertion (*Med. Gaz.*, vol. 48, p. 1063). Rupture of the heart from any of these natural causes is, however, a rare occurrence (*Med.-Chir. Rev.*, October, 1847, p. 460; *Lancet*, 1860, 1, p. 88; and Gamgee's "Pathol. Anat.," p. 7). It is of importance for the medical jurist to be aware that rupture of the heart may prove suddenly and rapidly fatal to life, although the lesion may not involve the cavities.

A lady, æt. 75, was suddenly seized with faintness and occasional fits of hurried respiration; she died in about an hour. On inspection the pericardium was found to be distended with twelve ounces of blood, one-third of which was in a coagulated state. A fissure was found in the superficial fibres about one-third of an inch in length, over the left ventricle and near the septum. There was another and smaller laceration a little higher up. The larger rent communicated with one of the coronary veins, and from this and some of the smaller arteries in the substance of the heart the hæmorrhage had proceeded. The lining membrane of the left ventricle was quite sound. Death had been caused by the mechanical effect of the blood in interrupting the heart's action (Cormack's *Month. Jour.*, June, 1845, p. 421).

When the heart is in a diseased condition, as in fatty degeneration, slight causes of excitement are sufficient to produce rupture and sudden death. Walking may thus give rise to fatal consequences.

A man was found dead upon a high-road. The right auricle was found ruptured near the superior vena cava; its substance was thin, soft, and very easily torn (Cormack's *Month. Jour.*, 1864, p. 343). A man died suddenly after a struggle with an adversary. No blows had been exchanged. In this instance the walls of the left ventricle were found much thickened, and the aortic valves were ossified; there was no rupture.

DEATH FROM THE ENTRANCE OF AIR INTO WOUNDED VEINS.

In wounds of *veins* there is an occasional and a peculiar cause of death which requires notice, namely, the entrance of air by the open mouth of the divided vessel. A man was labouring under chronic laryngitis, and a seton was introduced at the fore part of the neck. The skin was raised, and the seton-needle was passed horizontally through the skin, about two inches and a half above the breast-bone, and not at all near to the jugular vein or any other important blood-vessel. At the instant of its entrance there was a momentary hissing sound. The man became pale, his features were set, he fainted, and he subsequently became rigid and convulsed. The man did not recover his consciousness, was attacked with lockjaw, and died in seven hours. The medical evidence given at the inquest proved that

death had not arisen from loss of blood, but from air penetrating through a small vein which had been accidentally divided. A verdict was returned accordingly. After the inquest the body was inspected, and it was then found that the jugular veins and the large vessels of the neck were uninjured. The right auricle and pulmonary artery were distended with frothy blood, and the lungs were emphysematous (*Med. Gaz.*, vol. 41, p. 608). For another case of sudden death from this cause see *Med. Gaz.*, vol. 43, p. 1098, and vol. 45, p. 926.

Air gains access to the blood through a wound in a vein owing to the fact that during inspiration and certain phases of the heart's cycle of beating there is a negative pressure in the veins. Death is produced by the churning up of air and blood in the heart, the resultant mixture causing asphyxia. (*Vide* Rose and Carless, "Surgery.") Recovery from such a condition is, however, known.

WOUNDS AND RUPTURES OF THE DIAPHRAGM.

The diaphragm, or muscular partition between the chest and abdomen, is liable to be wounded either by weapons which penetrate the cavity of the chest or abdomen, or by the ribs when fractured by violent blows or falls; but, under any circumstances, wounds of this muscle are not likely to occur without implicating the important organs that are in contact with it. It is scarcely possible, therefore, to estimate the abstract danger of these injuries, as the medical opinion must materially depend on the concomitant mischief to the adjoining viscera.

Slight penetrating wounds of the diaphragm may heal, like those of other muscular parts; and cases of this kind are on record. There is, however, especially when the wound is of a lacerated kind, a consecutive source of mischief which no remedial means can avert—namely, that after the wound has, to all appearance, healed, the life of a person may be cut short by the strangulation of a portion of the stomach or bowels in the half-cicatrised aperture. An instance affords an illustration of this.

A sharp-pointed weapon had penetrated the diaphragm, notwithstanding which the patient apparently made a rapid and perfect recovery. At the end of about three months, however, the man died from a strangulated hernia or rupture involving the stomach, which had passed through the wound of the diaphragm into the thorax.

In a case of this description, when death occurs at a long period after the infliction of the wound, the witness may probably be required to say whether the wound was the cause of death, or whether there were any other circumstances which would have caused or facilitated the production of a hernia. The degree of culpability of an aggressor may materially depend upon the answers returned to these questions. *Phrenic hernia*, as this form of internal rupture is termed, is not by any means an unusual or unexpected fatal consequence of a wound of the diaphragm; and therefore it would appear, at first sight, that death, at whatever period this event may occur, should be referred to the original wound. But the case may present some difficulties, as it is possible that a slight blow on the stomach received subsequently to the wound, or even any violent exertion on the part of the deceased,

might have produced fatal strangulation. A person may survive with a large phrenic hernia for a considerable period, and die from some other cause. A case of this kind has already been related in which the stomach and part of the intestines were found in the left cavity of the chest, and the person lived for nine months. The fact of a person surviving will, however, depend on the freedom of communication between the chest and the abdomen. If the aperture is small and unyielding, strangulation may occur, followed by death within the usual period of time.

A man fractured two of his ribs by a fall. It was not until twelve months afterwards that he was admitted into hospital, where he died two days after his admission. On inspection it was found that about fourteen inches of the colon protruded into the chest through an aperture in the diaphragm, so small as only to admit the point of a finger. The intestine had become strangulated, and this had led to death. There was no doubt that the injury to the diaphragm had been occasioned by the same accident which had caused the fracture of the ribs. The hernia, judging from the symptoms, had taken place only a few days before death (*Med. Gaz.*, vol. 40, p. 584).

Another case has been elsewhere related in which a man, who was stabbed in a quarrel, died from phrenic hernia fifteen months afterwards. These two cases are of importance, inasmuch as they show that death may unexpectedly occur from the effects of an injury to the chest received a long time previously. They also prove the absurdity of that principle of the English law which makes the aggressor responsible for a fatal result only when the death happens within a year and a day after the receipt of a wound. (See Reid's "Physiolog. Researches," p. 521.)

The most serious injuries to the diaphragm are unquestionably those which are produced by violent contusions or falls on the abdomen at a time when the stomach and intestines are distended. On these occasions the muscular fibres may be ruptured to a greater or less extent; but the bleeding is not considerable, rarely exceeding two, three, or four ounces. A uniform result of such *ruptures* when extensive is a protrusion of the stomach into the chest, with sometimes a rupture of the coats of this organ and extravasation of its contents. Severe lacerations of the diaphragm are more readily produced during the act of inspiration than during expiration, the fibres of the muscle being then firmly contracted, and receiving, while in this state of tension, the whole of the force. According to Devergie, the rupture most frequently takes place in the central tendinous structure, where it is united with the left muscular portion above the crura. He has remarked that it occurs more commonly on the left side than on the right. It has been supposed that death was an immediate consequence of this accident, but this view is not supported by facts. In a case of extensive rupture of the diaphragm related by Devergie, in which the stomach and colon were found in the chest, the person lived nine months after the only accident which could have produced it, and then died from another cause. Besides the stomach, it sometimes happens that the liver, spleen, or intestines pass through the opening, and these organs are then liable to become strangulated; the lungs are at the same time so compressed that respiration is stopped, and asphyxia or suffocation may be an immediate result.

WOUNDS OF THE WALLS OF THE ABDOMEN.

Incised and punctured wounds, which affect the walls of the abdomen without penetrating the cavity, are not of so simple a nature as might at first sight be imagined. If the epigastric artery is wounded, the danger is immediate, for a fatal hæmorrhage will, in some instances, take place from a wound of this small vessel.

A carpenter, who had a chisel in his pocket, stumbled in walking, and received a wound in the abdomen with the edge of the tool. When brought to the hospital, the man appeared exhausted from loss of blood, and the skin was cold and pallid; he gradually became weaker, the pulse imperceptible, and he died a few hours after his admission. On an examination of the body the epigastric artery was found divided, and the cavity of the peritoneum distended with blood. It is true that in this case the abdomen was penetrated, but the real cause of death was the blood lost from the wounded artery. A man was brought to St. Thomas's Hospital who had been stabbed in the direction of the epigastric artery on the left side of the abdomen with a case-knife. He died in eighteen hours, apparently owing to bleeding from this vessel.

Among the other sources of danger from these superficial wounds is inflammation followed by suppuration beneath the tendinous membrane which covers the abdominal muscles. The matter formed is very liable to accumulate within the sheath of the muscles, and this may prove fatal unless proper treatment be adopted. The inflammation will sometimes extend to the peritoneum, and thus rapidly destroy life. As improper medical treatment may, in either of these cases, cause a superficial wound of the abdomen to take a fatal termination, so when a person stands charged with having inflicted such a wound it will be necessary for a medical witness to consider how far the consequences of the act of the prisoner have been aggravated by negligence or unskilfulness. (*Vide* Rose and Carless, "Surgery," "Treatment of Abdominal Wounds.") But when these wounds take a favourable course and heal, there is an after-effect to be dreaded, namely, a protrusion of the viscera at the cicatrised spot, constituting ventral hernia. When the wound has involved the muscular fibres transversely to their course, the cicatrix which follows is commonly far less capable of resisting the pressure of the viscera within than other parts of the parietes. A hernia may take place, and this, like other herniæ, if neglected, is liable to become strangulated and lead to the destruction of life. The walls of the abdomen, owing to the protrusion of this cavity, are easily penetrated by pointed instruments, and it requires but a slight force to traverse them completely and wound the intestines. A slight wound may thus prove fatal by leading to peritoneal inflammation. In 1861, Mrs. Cuthrey died from the effects of a penetrating wound produced by a table-knife being thrown across a dinner-table at her. The point of the knife penetrated the abdomen for about three-quarters of an inch. The deceased died from peritonitis. There was a slight opening in the small intestines.

Contusions are attended generally with far more serious effects on the cavity of the abdomen than on the chest. This arises from the coverings of the abdomen having less power to resist external shocks. In the first place, death may be the immediate result of a blow in the upper and central portions; no particular morbid changes may be apparent on inspection, and the violence may have been so slight as

not to have produced any ecchymosed mark on the skin. Death has been ascribed in these cases to a fatal shock transmitted to the system through a violent impression produced on the nerve-centre, called the solar or cœliac plexus. Some remarks have already been made on sudden death from blows on this part of the abdomen (see p. 386). Cases of this kind are of not unfrequent occurrence, and, in the absence of marks of physical injury in the part struck, a jury might be led to doubt whether the blow could have been the cause of death.

In *Rex* v. *Jones* (Warwick Sum. Ass., 1831) the prisoner was charged with having struck the deceased several blows on the breast and one on the pit of the stomach, by which he instantly fell down senseless and expired. No morbid appearances were found. The prisoner was convicted of manslaughter (Watson, "On Homicide," p. 75). In another case (*Reg.* v. *Sayers*, C. C. C., August, 1841) death was thus caused by violence during a pugilistic combat. A man received a blow in the stomach, and fell dead. As there were no marks of external injury, the surgeon thought the deceased had died of apoplexy. The prisoner was acquitted. A similar case was the subject of a trial (*Reg.* v. *Laws*, Norwich Lent Ass., 1854). The deceased, a powerful man, received during a pugilistic encounter a blow on the abdomen, and he instantly fell backwards dead. On an examination of the body there were no marks of injury, either externally or internally. The surgeon attributed death to sudden shock. The judge left it to the jury to say whether they thought the death of the deceased was caused by a blow; but if they could not say what was the cause of death, or if they should think that death was attributable to excitement, and that it was independent of the blow, the prisoner would be entitled to an acquittal. A verdict of not guilty was returned. Although the blow was seen to be struck, and was a sufficient cause of death under the circumstances, the jury probably thought that there should be some *visible* injury to the body.

Some surgeons have thought that these cases have not been accurately observed, and that in those which terminate fatally a more careful inspection would probably have shown visible changes in the organic structures. This fact, however, remains: persons have died soon after receiving severe blows on the upper part of the abdomen, and medical men of experience who have examined the bodies for the express purpose of detecting physical injuries have not found any to record. Moreover, they have not found in any part of the body a natural cause of sudden death.

Blows on the abdomen, when they do not destroy life by shock, may cause death by inducing peritoneal inflammation.

(*Reg.* v. *Martin*, C. C. C., 1839; also *Reg.* v. *Smith*, Manchester Lent Ass., 1871.) For two other medico-legal cases in which death arose from this cause see Cormack's *Month. Jour.*, May, 1846, p. 340.

Peritonitis thus induced is apt to be accompanied by inflammation of serous membranes in other cavities. Thus a person may be cut off by pleurisy depending on an attack of peritonitis produced by violence, while the former disease might possibly be referred to some other cause.

A woman received some severe blows on the abdomen from her husband. She died in five days. There were marks of pleurisy and peritonitis on dissection, the former much more decided. The medical witness, while he allowed that the peritonitis might have been caused by blows, thought that death had been produced by an attack of pleurisy from cold. The jury acquitted the husband. The reporter of the case considers that the attack of pleurisy was immediately dependent on the peritoneal inflammation produced by the violence (*Med. Gaz.*, vol. 25, p. 13).

This doctrine requires confirmation before it can be safely applied to medico-legal practice. Such a sympathetic connection between the two diseases must not only be rendered probable, but actually proved. [Such a view is now proved by bacteriology up to the hilt, and is universally accepted.—Ed.] Peritonitis thus produced by violence to the abdomen is not always fatal.

At the Swansea Lent Assizes, 1863, a man was convicted of manslaughter by giving to the deceased a kick in the lower part of the abdomen. No organ was ruptured, but peritonitis was set up, and death took place in two or three days. A soldier during an action was struck by a spent ball on the abdomen, over the region of the bladder. The ball fell on the ground at his feet without either injuring his clothes or even marking his skin. He did not feel much pain at the time, and walked to the hospital, a distance of two miles, with the ball in his pocket, but he died shortly afterwards from peritonitis and inflammation of the bladder. The entire surface of the abdomen presented the appearance of a severe bruise in a few hours after he was struck (*Edin. Med. Jour.*, March, 1863, p. 793).

Violence applied to the abdomen is not, however, always indicated by ecchymosis or injury to the skin. Effusions of blood in the sheaths or tendinous coverings of the muscles may or may not be indicative of violence. One fact must here be borne in mind, to prevent mistakes in examining a body after death, namely, that blood may be found copiously effused in and round the abdominal muscles, quite irrespective of the application of violence, but only when a definite discoverable disease is present, such as typhoid fever or nephritis.

Blows adequate to produce a laceration of the vessels and hæmorrhage would most probably be attended with ecchymosis, or some visible injury to the skin. At any rate, when such marks of violence are not visible, and there is no evidence of a blow having been struck, a witness would act wisely in declining to attribute the mere effusion of blood to the act of another person. Deeply penetrating wounds of the abdomen are generally fatal by reason of the injury done to the intestines and other organs. A soldier by accident so fell upon his bayonet that, although the weapon traversed the whole cavity of the abdomen (entering at the back and coming out in front below the navel), the man recovered in about six weeks (*Med. Times and Gaz.*, 1861, 1, p. 329). This case is of importance in reference to the situation and direction of wounds. Had there been no knowledge of the facts, this accidental wound might have been pronounced homicidal.

RUPTURES OF THE LIVER.

Blows on the abdomen may prove fatal by causing a rupture of the liver or other viscera, with extravasation of blood; and, as it has been elsewhere stated, these serious injuries may occur without being attended with any marks of external violence. Of all the internal organs the liver and spleen are the most exposed to rupture, owing to their compact structure, which prevents them from yielding to a sudden shock like the stomach and intestines. Ruptures of the liver may occur from falls or blows; but this organ may be ruptured merely by a sudden action of the abdominal muscles. An accident of this kind happened to a person who was endeavouring to avoid a fall from his horse. A fall on the feet from an elevated spot may also produce

laceration of this organ. Ruptures of the liver are generally seen on the convex surface and anterior margin, seldom extending through the whole substance of the organ, but consisting of fissures, varying from one to two inches in depth. The right lobe, from its size, is more commonly affected than the left. Their usual direction is from before backwards, with a slight obliquity; they rarely intersect the liver transversely. The lacerated edges are not much separated, while the surfaces present a granular appearance. But little blood is met with in the laceration; it is commonly found effused in the lower part of the cavity of the peritoneum, or in the hollow of the pelvis, and is only in part coagulated. Ruptures of the liver, unless they run far backwards and involve the vena cava or portal vein, are not in general attended with any considerable hæmorrhage; but the bleeding, should this vessel be implicated, is sufficient to cause speedy destruction of life. Under other circumstances a person may survive some hours, as the blood may escape only slowly, or it may be suddenly effused in fatal quantity after some hours or days, as a result of violent exertion or of fresh violence applied to the abdomen.

A man went to hospital in whom there were no immediate or urgent symptoms. He was sent away, and a few hours afterwards was found dead in a cell at a police-station. On inspection the liver was lacerated nearly through its diameter, and a basinful of blood was found in the cavity of the abdomen (*Med. Times and Gaz.*, 1864, 2, 527). This effusion must have taken place after the man had left the hospital. On the other hand, death may be a slow result of this injury. In one case a man is reported to have died from a rupture of the liver which had occurred from an accident eight years before (*Med.-Chir. Rev.*, January, 1836, p. 296).

In 1841 a drunken man was admitted into Guy's Hospital. There was no mark of violence about him, but he appeared helpless from intoxication. He died in nine hours, and on inspection two quarts of blood were found effused in the abdomen. This had flowed from a large rupture in the right lobe of the liver. It had probably escaped slowly, for the man was able to move about just before he died. Another case was admitted in 1861. There was an extensive laceration of the liver; but there were no symptoms of this severe injury, and its existence was not even suspected until the man died suddenly on the day after his admission. See also Cormack's *Jour.*, May, 1846, p. 341. In 1862, a man who had been in good health half an hour before was found dead upon the high-road, and there was reason to believe that he had been run over by his own dray. The abdomen was found full of effused blood, which had proceeded from a large rupture on the under-surface of the right lobe of the liver. It was T-shaped, five inches in the transverse, and about two inches in the longitudinal direction. The diaphragm was ruptured on the right side for about four inches from before backwards, and the liver protruded through the aperture into the chest. On opening the head about two tablespoonfuls of blood were found effused between the membranes; and the substance of the brain was unhealthy. There were no marks of external violence. There was not the slightest scratch, abrasion, or discoloration of the skin; but the sixth and seventh ribs were broken transversely near their anterior extremities. From the state of the brain it was thought probable that the man had had an apoplectic seizure, and had fallen under the wheel of the dray.

Ruptures of the liver generally prove fatal within forty-eight hours. One case has been related in which the person survived for eight years; and a case occurred in which a patient in Guy's Hospital survived this accident ten days. On inspection it was found that the diaphragm had been ruptured as well as the liver, and that the two had united, an abscess having been formed between them. The liver had been lacerated on its right side (*Lancet*, 1864, 2, 716).

In another case, in which the patient survived ten days, death took place from internal hæmorrhage. On inspection there was a rupture of the right border, involving the entire thickness of the liver. It arose from a fall from a three-storey window. There were no external marks of injury (*Amer. Jour. Med. Sci.*, April, 1870, p. 415). Another case proved fatal in twenty-four hours (*ib.*, July, 1870, p. 144). In a case in which the liver was found adhering to the false ribs, a fatal rupture was caused as a result of violent muscular action. The liver was large, and its substance brittle (*Vierteljahrsschrift*, April, 1872, p. 324).

Ruptures of this organ may take place from violence applied to the *chest*, and there may be no marks of injury in the region of the liver (*Med. Times*, August 30th, 1851, p. 234; *Med. Gaz.*, vol. 47, p. 156). In the case of *Reg.* v. *Cuffery* (Liverpool Wint. Ass., 1863), a question presented itself in reference to these ruptures as to the time required for the effusion of a large quantity of blood into the abdomen when none of the large vessels are involved in the laceration.

A police-constable was charged with having caused the death of a man. The deceased was drunk, had fallen three times, and had been kicked and maltreated by a mob. The prisoner took or dragged him to the station, and in an attempt to escape he knocked down the deceased and fell on him, his knee striking the abdomen. The deceased appeared to suffer great pain when he was lifted up, but he was able to walk to the station with assistance; when there he soon became insensible, breathed heavily, and died fifteen or twenty minutes afterwards. On inspection the liver was found to be ruptured in three places, but none of the large bloodvessels were involved. Upwards of three pints of blood were effused in the abdomen, and the medical witnesses agreed that death was owing to internal hæmorrhage as a result of the ruptures. The question, however, arose whether the ruptures were caused by the violence of the prisoner about twenty minutes before death, or by any of the falls and ill-treatment which the deceased had previously sustained.

It was contended in favour of the prisoner that so large a quantity of blood could not be effused in so short a period as a quarter of an hour or twenty minutes when the rupture involved only the substance of the liver, and not the large bloodvessels. Hence it was alleged the rupture must have been caused by the previous violence. One medical witness thought it possible that this quantity of blood might have escaped from the smaller vessels within the time mentioned; another thought that it would have taken at least half an hour for such an extensive effusion to be produced. The prisoner was acquitted.

The question here raised was based on a refined speculation, and it is not surprising that the witnesses differed. The violence received before the prisoner took the deceased into custody was admitted to have been quite sufficient to account for the ruptures of the liver and the fatal hæmorrhage, and there was nothing to fix it on the act of the prisoner. We have no means of measuring the rapidity with which blood flows on these occasions. It is stated that the liver was ruptured in three places; hence an extensive bleeding surface must have been exposed. The man was able to walk after the violence; and this exertion may have added to the hæmorrhage. Lastly, the bleeding would probably continue after death so long as the blood retained its warmth and fluidity. The prisoner was acquitted, not because the amount of effusion was inconsistent with the time assigned, but because there was a failure of evidence to show that the rupture was caused by his violence. Assuming that the rupture existed when the deceased was struck by the prisoner, it might have been a question whether his violence had not accelerated death by increasing the hæmorrhage.

WOUNDS OF THE GALL-BLADDER.

Wounds and ruptures of the gall-bladder are necessarily attended with the effusion of bile. This fluid finds its way into the cavity of the abdomen, and the person may die from peritonitis. In a fatal case of this description, an old man, while getting out of bed, fell with great violence on the floor. He died from peritonitis in forty-eight hours. The gall-bladder was ruptured, and a large stone was found impacted in the cystic duct (*Med. Gaz.*, vol. 37, p. 967). Dr. Stevenson met with a case where the gall-bladder was pierced by a stab in the abdomen.

In the *Lancet*, vol. 1, 1904, the editor has fully recorded a case in which a slight fall on a hard frosty road produced a laceration of the mucous membrane only of the gall-bladder without extravasation of bile. The claim for accidental death was paid on the report of Mr. Moullin and the editor.

RUPTURES OF THE SPLEEN.

Ruptures of the spleen may occur either from violence or disease, and it would appear from the following case (*Med.-Chir. Rev.*, October, 1839) that a slight degree of violence is sufficient to rupture this organ, while there may be no marks of injury externally.

A middle-aged man was observed fighting with a boy about fourteen years of age, who in stature scarcely reached to his waist. When the fight had terminated the boy ran away; the deceased was observed to become weak and faint, and he complained of uneasiness in his left side. He expired a few minutes afterwards. On inspection no marks of violence could be detected externally; but the cavity of the abdomen contained a large quantity of blood. The spleen was found enlarged, and so softened that its structure was broken down by the slightest pressure. There was a laceration across its surface, about half an inch in depth, from which the fatal bleeding had proceeded. A similar case, in which death occurred in fifteen minutes, is reported in the *Med. Gaz.*, vol. 35, p. 942. The rupture was caused by a blow, but there was no mark externally to indicate that a blow had been struck.

A case of spontaneous rupture of the spleen, which was enlarged and in a diseased condition, is reported in the same journal for June, 1842. A little girl died in fourteen hours from rupture of the spleen. The rupture had arisen from the wheel of a cart passing over her body. There was no mark of external violence. It is highly probable that, when the liver and spleen are ruptured from slight causes, the structure of these organs will be found to be in a diseased condition—a circumstance which might in some cases be regarded as mitigatory of the act of an assailant (*Med. Gaz.*, vol. 35, p. 942).

A man, æt. 24, fell from a masthead, twenty-five feet in height, and it was thought that he had fallen on his back. He was rowed ashore, and walked to the hospital, where he arrived about an hour after the accident. He died in a quarter of an hour, apparently from internal hæmorrhage. On inspection there were no external signs of injury. The abdomen contained several pints of blood. The spleen was torn transversely through its middle, and the splenic vein was lacerated in a longitudinal direction. This organ was about twice its natural size, soft, and had the appearance of a large ague spleen (*Lancet*, 1864, 2, p. 716). The exertion of walking probably led to the fatal effusion, and accelerated death.

Another case will be found in the *Lancet* for April 23rd, 1904.

In malarial countries, rupture of the spleen assumes an importance which in non-malarial districts it can hardly lay claim to. This is owing

to the fact that when it is enlarged (as it so frequently is from malaria) very slight violence is required to cause a rupture which without treatment is likely to prove fatal. In the *Ind. Med. Gaz.*, June, 1902, will be found an exhaustive article on the subject by Dr. G. Crawford, Lieutenant-Colonel I.M.S., from which the following notes are taken. He collected notes of 304 cases in which autopsies were made for judicial as opposed to scientific purposes. He discusses these under twelve headings. He records one case in a female child æt. 18 months and one a man of seventy, both killed by kicks. Blows with a *lathi* (a heavy stick something like a very long—six to seven feet—Irish shillelagh) account for over a hundred cases. Dr. Crawford continues on causation :—

"*Pressure on the body* is given as the cause of only two deaths out of the whole series of 304 cases, both in Backerganj. I was surprised to find so few cases ascribed to this cause, as it is well known in many parts that severe internal injuries may be caused in this way with little or no external marks of injury. The drawback to this form of murder is that it requires the participation of several hands. It is carried out in two ways : either one man jumps on the prostrate body of the victim, or pounds the body all over with knees, elbows, and heels, while several others hold him down ; or else two men place a bamboo across the body at a right angle, and then, one sitting on each end of the bamboo, seesaw it all up and down the body, from neck to groin. This second method also requires the co-operation of others holding down the victim.

"The sixteen cases returned as due to miscellaneous causes show a considerable variety. Midnapur shows two such cases. In one death was caused by a clod of earth thrown, striking the left side of the body, in the other by an elephant. Dinajpur shows the largest number of deaths under this heading, five : a blow with a shoe ; a blow with a wooden stool ; a prod from a cow's horn ; injuries inflicted in the attempt to effect sexual intercourse, the victim being a female child of twelve ; and accidental injuries caused in a game, *dadhikada*, in which one man tries to take away by force a cocoanut, which another man holds against his chest. Two cases at Dakka were caused by a blow with a *puta*, or grinding stone, and by the kick of a horse, two at Mymensingh, one by being knocked down by a horse, the other by a stab. One in the 24-Parganas was due to being knocked down (not run over) by an engine ; two of the four deaths at Hughli were also thus caused ; the other two at Hughli were due to a blow from the shaft of a stationary engine in a jute mill, and a blow on the left side from a ball thrown in play during a game.

"The Mymensingh case due to a stab is one of the few which I give in detail, as an instance of how trivial a blow may cause death from rupture of the spleen. The post-mortem examination in this case was made by myself: 'Nabu Sheikh, Mussulman, male, forty, of Diwanganj, November 14th, 1886, said to have been killed by a stab. A small wound, three-quarters of an inch long, gaping half an inch wide, over eighth left rib, about five inches above and external to the umbilicus. From its outer end a slight scratch runs upwards and outwards for three inches. This wound was quite superficial, one-eighth of an inch deep, *penetrating only into, and not through, the subcutaneous*

cellular tissue. Peritoneum healthy, contained about half a pint of dark fluid blood round the spleen; stomach healthy, empty; liver enlarged and congested; spleen enlarged, about twice normal size, a rupture three inches long, crossing outer side half-way between upper and lower ends. Death was due to rupture of the spleen, probably caused by the blow, trifling in itself, which inflicted the wound over eighth rib.'

"The one case in which the victim was a European occurred in the 24-Pargauas in 1898. Deceased was a male, thirty-eight years old; he was suffering from diarrhœa and bronchitis; he slipped and fell in his bath-room, complained of difficulty of breathing, and died in a few minutes. The lower lobes of both lungs were congested; peritoneum contained five pounds fluid blood and several large clots; stomach congested, contained one drachm greenish liquid; spleen weighed one pound three ounces, and measured seven inches long, five broad, two thick: there were four lines of rupture on the internal surface. Probably in falling deceased came down with his left side on the small wall which usually divides a bath-room.

"In two cases a well-marked ligature mark round the neck with other signs of hanging were found in conjunction with rupture of the spleen. In one case, at Mymensingh, the rupture was small, and the reporter suggests that it may have been caused in taking down the body after death. In the second case, from the 24-Parganas, the peritoneum contained one pound and a half dark fluid and clotted blood; the spleen was much enlarged, five times the normal size, with a rupture five inches long, one and a quarter deep, crossing its internal surface.

"The post-mortem report states that the rupture of the spleen would have caused death, but that the body was probably hung up before death to divert suspicion, and that death was actually due to hanging.

"*Complications.*—Under this head I propose to describe briefly the other injuries suffered at the same time as rupture of the spleen, giving the cause of death (if stated) in each case. This may most conveniently be done district by district. But a short summary of the various complications may first be given. In thirty-two cases some other organ suffered rupture as well as the spleen, *i.e.*, in rather over 10 per cent. of the whole; in nineteen of these thirty-two cases, or in over 6 per cent. of the whole series of 304 cases, the liver was ruptured.

Liver ruptured	... 15 cases.
Liver, lungs, and heart	... 1 case.
Liver, lungs, and right kidney	... 1 ,,
Liver and right kidney	... 1 ,,
Liver and stomach	... 1 ,,
Left kidney	... 5 cases.
Heart	... 3 ,,
Intestine (duodenum one, ilium one) ...	... 2 ,,
Peritoneum	... 1 case.
Omentum	... 2 cases.

"*Period of Survival.*—The questions of how long a man may survive rupture of the spleen and whether he may possibly recover

from such an injury are of much interest. They are, unfortunately, questions upon which this large series of cases throws next to no light. In only three out of the whole 304 cases is the point even mentioned."

In the three cases death occurred on "a few days later," three days and seventeen days respectively.

Lieutenant-Colonel E. G. Russell, I.M.S., in his work on "Injuries of the Spleen" (pp. 217—221), gives two cases in which recovery apparently took place after rupture or bruise of the spleen, the diagnosis in one case being confirmed by dissection of the victim, who died several years afterwards. He also quotes four cases in which the victim survived the injury for over twenty-four hours, in one case five, in two four, and in one two and a half days.

In the same June number of the *Ind. Med. Gaz.* Captain C. H. James records a case of spontaneous rupture of the spleen:—

Ali Bux, a fine-looking old Mahometan, aged about fifty years, was engaged in a lawsuit in the Deputy Commissioner's Court on October 10th, 1900. He appeared to be in good health, and took a very lively interest in the proceedings in which he was the complainant. While engaged in cross-questioning one of the witnesses he suddenly became faint, fell down, and was carried out of court, and expired in the compound. The death was so sudden and so unexpected that the Deputy Commissioner ordered the body to be sent to the civil surgeon for examination. The man had been in court the whole morning, and appeared to be in perfect health. The friends who brought the body to the Civil Hospital were most emphatic that he had not received any blow or knock of any kind, and an inspection of the court where he became faint convinced me that there was no furniture or projecting angles where he could accidentally have knocked against something to cause internal injuries.

On opening the abdomen on October 11th I found the peritoneal cavity full of a bloodstained fluid. There were also fresh blood clots. The amount of the fluid could not be measured, but probably there were several pints.

The spleen weighed 3 lbs. 13 oz., and measured 9½ inches by 6½, and was 3½ inches thick. On its inner surface, anterior to and parallel with the hilus, was a rent in the capsule 6 inches in length. The opening was plugged with fresh black blood clot. The substance of the spleen was soft and friable.

There were no other injuries or signs of disease.

In this case we have an elderly man apparently in good health, but who was subsequently found to have an enormously enlarged spleen.

The simple excitement of the lawsuit appears to have been sufficient to cause an extra strain on the spleen, whether by causing an undue hyperæmia of the organ or whether by some slight movement or compression of the abdominal muscles I will not pretend to say, but the result was disastrous. He suddenly became faint, fell down, and was carried out of the court to die outside. I tried very hard to get a history of even a slight blow, but there were many persons present at the time of the attack, and they were very definite in their reply that the man could not possibly have received any injury.

The large size of the rent in the spleen is also a matter of interest, as it proves that no deductions can in ordinary cases be drawn between the size of the rupture and the force of the blow which causes the injury. In this case we have a very large tear, and yet there was no blow or force of any kind applied externally.

RUPTURES OF THE KIDNEYS.

The *kidneys* are occasionally ruptured from violence, but this appears to be a rare accident without considerable violence, but many cases of it will be found in the records of the pathological department of the London Hospital. Two cases were reported to the Med.-Chir. Soc. (*Lancet*, November, 1843). In one the person recovered; in the other death did not take place for a considerable time. In another case the

injury occurred during a scuffle; its existence was not suspected during life. A rupture of the kidney may be produced without any prominent symptoms and cause death in a few hours. A man, æt. 60, was run over by a light cart. He walked to the house of a friend at a short distance and went with him to the hospital in a cab. It was found that three ribs were fractured, but there was no urgent symptom or sign of collapse. He was treated for fractured ribs, and then walked home with his friend and went to bed. Between five and six hours after the accident he was observed to sit up in bed and suddenly fall back dead. On inspection no bruise or wound of any kind was found on the injured side. There was a large quantity of fluid and coagulated blood in the abdomen. This had evidently proceeded from the right kidney, which was torn in half transversely through the pelvis. The ninth, tenth, and eleventh ribs were fractured. It is probable that the blood had escaped slowly from the ruptured organ. The case proves that a kidney may be torn in halves and yet the person possess a power of locomotion and muscular exertion. For a case of extreme laceration of a kidney not proving fatal, *vide Lancet*, 2, 1903, p. 1234. The laceration in this case arose from a fall on the edge of a bucket, and the patient recovered in six weeks after operation.

RUPTURES AND WOUNDS OF THE INTESTINES.

Ruptures of the intestines sometimes occur from disease, and in a case of rupture alleged to have been produced by violence we must always take this possible objection into account. The ruptured part of the bowel should be carefully examined in order to see whether there are any signs of ulceration or softening about it. If not, and there is clear evidence of violence having been used, it is impossible to admit this speculative objection. If with the proof of violence there should also be a diseased condition of the bowel we may be required to say whether this did not create a greater liability to rupture, a point which must be admitted. The intestines may be ruptured by an accidental fall (*Med. Times and Gaz.*, 1861, 1, p. 403). Rupture of the intestines may occasionally occur from very slight causes. Any force, as a slight blow *suddenly* applied to the abdomen, will sometimes suffice to cause it.

A case has already been related where the blow of a pebble ruptured the jejunum of a young girl by striking the abdomen. A case is reported in which there was no doubt that the ilium had been ruptured by a kick on the abdomen, leading to death by peritonitis. The coroner and jury appear to have thought that, as there was no mark of contusion or ecchymosis on the abdomen, the blow could not have been the cause of the mischief; hence they came to a verdict that the deceased had died from inflammation of the bowels depending on some unknown causes (*Lancet*, August 9th, 1846, p. 15). It is worthy of remark that a rupture of the intestines does not necessarily deprive a person of the power of locomotion. A boy, æt. 13, had his duodenum completely ruptured across by a blow; he walked a mile with but little assistance, but he died in thirteen hours (*Med. Gaz.*, vol. 12, p. 766). A boy of thirteen was struck by a cricket-ball in the right groin, in spite of which injury he remained on the ground more than an hour and a half and then walked more than a mile to his home. He died on the fifth day from peritonitis as a result of rupture of the intestines and escape of the contents (*Amer. Jour. Med. Sci.*, April, 1870, p. 485). A kick in the same part led to rupture of the small intestines and death in twelve hours (*Vierteljahrsschr. d. Ger. Med.*, April, 1872, p. 235).

That rupture of the intestines is not incompatible with the power of locomotion is also proved by a case where the cæcum was ruptured; the man was able to walk after the accident, but he died in twenty-four hours. Other instances of this kind are reported by Henke. The ilium is observed to be most liable to rupture from accident.

In 1861 a man was brought into Guy's Hospital. He was able to walk to his bed, and he did not appear to be seriously injured, although it was stated that a bale of wool had fallen on him. In the evening he became collapsed, and he died twelve hours after his admission. On inspection about a pound of blood was effused in the abdomen, and a portion of the ilium was found lacerated, the laceration extending into the mesentery and including the bloodvessels. The laceration was about an inch and a half long, and the bowel was divided not quite through. The intestines were much matted together by lymph and blood, the result of peritoneal inflammation. There had been only slight extravasation of the contents (*Med. Times and Gaz.*, 1861, 1, p. 271). In two fatal cases of ruptured jejunum, one arising from a kick on the abdomen and the other from an accidental fall, it was observed that the power of locomotion and muscular exertion was retained.

Punctured wounds, which merely touch the bowels without laying open the cavity, are liable to cause death by peritonitis. These injuries to the intestines sometimes destroy life by shock; there is but little blood effused, and the wounded person dies before peritonitis can be set up. Severe wounds to the intestines may, however, be inflicted almost without the consciousness of the individual, and the wounded person may be able to walk a considerable distance (*Med. Gaz.*, vol. 46, p. 24).

WOUNDS AND RUPTURES OF THE STOMACH.

Wounds and ruptures of the stomach may cause death by shock. Ruptures commonly give rise to severe pain, sufficient of itself to bring about speedy death. The stomach may be ruptured from spontaneous causes, as in ulceration from disease, but sometimes there is no morbid cause apparent. In 1828 a man, æt. 34, was brought into hospital complaining of severe pain in the abdomen. Ten hours afterwards he was seized with violent vomiting; the pain and the vomiting ceased, and he died in five hours more. The posterior surface of the stomach was found lacerated to the extent of three inches, and its contents had escaped through the aperture; the mucous membrane was reddened, but there was no thickening, ulceration, or any apparent disease. A man, æt. 30, labouring under intermittent fever, died suddenly after having been to the water-closet. On inspection the stomach was found ruptured on its anterior surface to the extent of about two inches, and the contents had escaped into the abdomen. There was no softening or morbid change in the coats, with the exception that the mucous membrane was dotted with redness for a slight distance around the aperture (*Phil. Med. Exam.*, November, 1845, p. 695). A case occurred in which the stomach was ruptured at its pyloric end. The spleen was also ruptured by the same accident—a fall of about twenty feet. The man died in about fourteen hours, evidently from internal hæmorrhage. The rupture was about five inches in length, and extended from the pyloric end of the stomach into the duodenum (*Amer. Jour. Med. Sci.*, October, 1870, p. 575). A remarkable feature of this case was that there was no indication of

bruise or other external injury. Such an injury is not inconsistent with the power of locomotion, although it may be doubted whether in the case reported the large rent in the stomach took place until just before death (*B. M. J.*, 1870, 2, p. 617). It is obvious that in alleged lacerations from violence this liability to spontaneous rupture must not be forgotten. Penetrating wounds of the stomach generally prove rapidly mortal, but they seldom form a subject for medico-legal investigation. A case was tried at the Norwich Assizes in 1832 in which a man was charged with the murder of his wife by throwing at her a red-hot poker. The weapon completely perforated her stomach, and the woman died in six hours.

RUPTURES OF THE BLADDER.

This injury is frequently the result of blows on the lower part of the abdomen. The principal questions in reference to the accident are—Was the rupture the result of wilful violence, or of an accidental fall? or, Did it proceed from spontaneous causes, as from over-distension? The spot in which rupture commonly takes place is in the upper and back part, where the bladder is covered by the peritoneum. The aperture is sometimes large, at others small; but the effect is that the urine is effused, and death takes place sooner or later from inflammation. Ruptures, when attended with extravasation of urine into the peritoneal cavity, are almost uniformly fatal; but if the rupture occurs in the under-part of the bladder, and the urine finds its way into the cellular tissue, the medical opinion is not so unfavourable. Some observers have even met with cases of recovery when it was asserted that the peritoneum was involved in the rupture. A case of this description was reported (*Lancet*, November, 1843), and another in which the patient, while his bladder was full, struck the lower part of his abdomen against a post. He fell, but was afterwards able to reach his home with some difficulty, at a distance of one hundred yards. He suffered under all the usual symptoms, and in eighteen hours peritonitis appeared. This was subdued, but again supervened, apparently from rupture of the adhesions. In two months, however, the patient had wholly recovered (*Lancet*, July 25th, 1846, p. 112). Such cases of recovery are very common now that the abdomen can be opened with such little risk. (*Vide* Rose and Carless, "Surgery.")

The usual period at which death occurs from this accident is in from three to seven days; but in one case the person did not die until the fifteenth day. The cause of death is obviously peritoneal inflammation; but a person may die suddenly from this injury as a result of shock (*Assoc. Jour.*, January 28th, 1853, p. 88).

A man, while struggling with another, received a severe kick on the lower part of the abdomen. He fell backwards, and died immediately. On inspection the brain was congested, but otherwise healthy; the heart was free from disease, but much distended with black coagulated blood. The bladder presented, on the left side of the body, a rent of about two inches; but this organ was in other respects healthy, as well as the urethra. There was some bloody effusion in the cellular tissue. The peritoneum and viscera of the abdomen were uninjured. There were no marks of violence on the body.

When these ruptures are produced by blows, they are rarely accompanied by marks of ecchymosis, or of injury to the skin. Thus,

then, there may be no means of distinguishing, by external examination, whether a rupture was really due to violence or to spontaneous causes.

During a quarrel one man struck another a severe blow on the lower part of the abdomen. The latter was carried home, confined to his bed, and died in seven days. There were only a few superficial excoriations on the skin of the abdomen. The bladder was found ruptured to the extent of two inches in its upper and back part; it was highly inflamed. Throughout the abdomen there were the marks of general peritoneal inflammation, of which the man had died. There was a sanguineous fluid effused, exhaling a strong ammoniacal odour.

Some doubt was thrown on the correctness of the medical opinion that the rupture had been caused by a blow, because there was no ecchymosis or other mark indicative of a severe blow over the region of the bladder. The witnesses properly answered that ruptures of the viscera of the abdomen from violence were not necessarily attended with the marks of violence found in injuries to other parts, owing to the yielding and elastic nature of the parietes. One of them mentioned a case that had occurred to him where a soldier had received in the abdomen a kick from a horse, which had ruptured the small intestines, and caused death; but there was not the slightest trace of violence externally.

In another case (*Reg.* v. *Eccles*, Lancaster Lent Ass., 1836), the prisoner, who was half intoxicated, met the deceased on the high-road, and without receiving any provocation gave him a violent kick on the lower part of his abdomen. The deceased turned sick; he attempted to pass his urine, but could not; he was conveyed home, and died from peritonitis in five days. There was no ecchymosis, or other injury to the skin indicative of external violence; but the bladder was found ruptured, and the contents extravasated. The rupture was attributed to the blow inflicted by the prisoner. In the defence, it was urged that, as there was no mark of a blow, the rupture might have occurred spontaneously from simple over-distension. The judge observed that, if the rupture was thus occasioned, it was extraordinary that it should have happened immediately after a violent blow had been struck on the part. The distension of the organ might, however, have rendered the blow *more dangerous* than it otherwise would have been. The prisoner was convicted.

As an attempt may be made, in cases in which death has resulted from this injury, to refer rupture of this organ to natural causes, it may be observed that this is an unusual occurrence; a rupture is almost always the result of violence directly applied to the part while the organ is in a *distended* state. A *spontaneous rupture* may, however, occur—(1) when there is paralysis, with a want of power to expel the urine; (2) when the bladder is ulcerated, or otherwise diseased; (3) when there is an obstruction in the urethra from stricture or other causes. (4) Cases are recorded in which no cause whatever could be found. For a fatal case of rupture of the bladder arising from obstruction as a result of disease see *Med. Times and Gaz.*, December 13th, 1856, p. 590. The causes of spontaneous rupture are recognisable by ascertaining the previous condition of the deceased or examining the bladder and urethra after death. If a man were in good health prior to being struck; if he suddenly felt intense pain, could not pass

his urine afterwards, and died from an attack of peritonitis in five or six days; if after death the bladder was found lacerated, but this organ and the urethra were otherwise in a healthy condition, there can be no doubt that the blow must have been the sole cause of rupture and death. A diseased state of the bladder might probably diminish the responsibility of an accused person for the consequences; therefore the state of this organ should be closely looked to on these occasions. From the case mentioned above it might be inferred that the fact of the bladder being *distended* at the time of the blow would be held an extenuating circumstance; but we can hardly suppose that such would be the deliberate opinion of our judges. The fact is, this most serious injury is never liable to occur from violence, except when the bladder is distended. If a pregnant woman be killed by a blow on the abdomen, which causes rupture of the uterus, the act cannot be regarded as admitting of mitigation because the uterus is only occasionally in this distended state.

The Bladder Ruptured by an Accidental Fall.—The following case shows that this accident may readily occur:—

A woman, æt. 26, fell forwards over the edge of a tub, and fainted immediately. On recovering herself she complained of intense pain in the abdomen, with inability to pass the urine. Peritonitis came on, and she died in a week. On inspection a small aperture was found in the upper part of the bladder; the peritoneum was extensively inflamed owing to the urine which had become effused. The ruptured surfaces had become partly glued together (*Edin. Med. and Surg. Jour.*, October, 1836). Rupture of the bladder may take place from an accidental fall, and cause death without necessarily laying open the peritoneal cavity. For two cases of this kind see *Med. Gaz.*, vol. 36, p. 621. The patients were sailors who fell from their hammocks while in a state of intoxication. The usual symptoms followed; one died in five, and the other in eight days, from peritonitis; and after death it was found, in one instance at least, that the bladder had been ruptured in the usual situation, but the peritoneum was entire, although in a state of intense inflammation. Another case of this kind was the subject of a trial (*Reg.* v. *Dixon*, Durham Lent Ass., 1846). The prisoner kicked the deceased in the pubic region from behind. The man died from peritonitis in thirty-five hours. On inspection the bladder was found ruptured near its neck for about half an inch immediately above and to the left of the prostate gland. The urine was extravasated in the cellular tissue of the scrotum; but although there was extensive inflammation, the peritoneum was not lacerated. A remarkable case is reported in which a man died on the sixth day from rupture of the bladder; and after death, although the peritoneum was lacerated, and the cavity of the abdomen was filled with dark-coloured urine, there was no sign of peritoneal inflammation (*Lancet*, December 19th, 1846, p. 660). This accident is liable to occur in women during parturition, owing to the pressure of the child's head, an occurrence which may throw a charge of malpraxis on the medical attendant. He is expected to know the probability of such an accident occurring, and to guard against it, if necessary, by the use of the catheter. In *Reg.* v. *Balsoner* (Liverpool Lent Ass., 1838), a surgeon was tried on a charge of this kind. It is important to remember that although rupture of the bladder is commonly attended, at the time of its occurrence, with intense pain, sickness, and prostration, yet persons may occasionally retain the power of exerting and moving themselves after the accident. Such cases are too well known to need further exemplification, but their treatment and prognosis of late years has been revolutionised from that of the pre-antiseptic days.

In punctured and incised wounds of the bladder the urine is immediately extravasated, but in gunshot wounds the extravasation does not commonly take place until the sloughs have separated. Thus life may be protracted longer in cases of gunshot than under other wounds of the bladder. Barzellotti relates the case of a man, shot

through the bladder in a duel, who did not die until the *twentieth day* from peritonitis, which supervened on the extravasation ("Questioni di Med. Leg.," t. 3, p. 174). One instance of a person recovering from a gunshot wound perforating the bladder is reported in the *Edin. Med. and Surg. Jour.*, vol. 13, p. 313. For the discovery of effused liquids or blood in wounds and other injuries to the abdominal viscera we must look to the cavity of the pelvis, as it is here that, for obvious reasons, such liquids have a tendency to collect.

WOUNDS OF THE GENITAL ORGANS.

Wounds of these organs, whether in the male or female, may prove fatal to life by excessive hæmorrhage. Self-castration or mutilation is not unfrequent among male lunatics and idiots. The practice of circumcision on infants is sometimes followed by fatal results. Schwartz met with two cases of boys, eight days old, who were submitted to this rite, and both died of phlegmonous inflammation, one five days and the other twenty-five days after the operation (*Lancet*, 1870, 2, 471). The editor met with a case in 1904 in which the child died from absorption of carbolic acid from the dressings applied.

Incised, lacerated, or even contused wounds of the female genitals may prove fatal by loss of blood, not from the wound involving any large vessel, but from the numerous small vessels which are divided. Two women were in this way murdered in Edinburgh some years since. The wounds were inflicted by razors, and the women bled to death. (See Watson, "On Homicide," p. 104.) This crime appears to have been at one time frequent in Scotland. When deeply *incised* wounds are inflicted upon the genital organs of either sex, the fact of their existence in such a situation is strongly presumptive of wilful and deliberate malice on the part of an assailant, or deliberate suicide. Such wounds require to be carefully and minutely examined, for the proof of this kind of wound when fatal may be tantamount to a proof of murder. A contused wound of the genitals may cause death by hæmorrhage.

A case is reported in which a woman, in the eighth month of pregnancy, fell from a chair, which also fell with her. There was hæmorrhage, and she died in a quarter of an hour. The blood had flowed from a wound an inch and a half long, situated between the right labium and the urethra. The edges appeared to be cleanly divided, and the wound penetrated into the cellular tissue (*Dublin Quart. Jour.*, 1870). In the case of *Reg.* v. *Ling* (*Lancet*, 1870, 2, 268), the medical evidence for the prosecution went to show that a wound in the vulva of a female, found dead from hæmorrhage, had been produced by a stick on which blood and hair were found. A medical man who appeared for the defence thought that a varicose vein had burst and caused the bleeding, and that the injury had not been produced by the violent use of a stick. The jury acquitted the prisoner.

A practitioner may be sometimes required to determine whether wounds affecting the female organs have resulted from accident, have been self-inflicted, or inflicted by others with homicidal intention.

In 1842, a woman received a longitudinal wound in the genitals on the left side by a cutting instrument to the extent of an inch and a half. There was a smaller wound on the right side. The accused alleged that the woman had inflicted the injury on herself; and Easton, on being required to state his opinion on the question at issue, came to the conclusion—(1) from the regular edges of the wounds, that they had been produced by a clean cutting instrument, and therefore could not have been caused by a fall, excepting the person had fallen upon some

sharply cutting projection; (2) if the woman had injured herself by thrusting a knife into the private parts, the situation and direction of the wounds would have been different. There was a want of proof to connect the prisoner with the act, and he was discharged.

This is an improbable situation for the self-infliction of wounds with a view to suicide. Accidental wounds of the genitals, unless all the circumstances are known, may sometimes resemble those produced by design. It must be remembered that the vagina is very close to the pubic bones, and thus from a blunt force a clean cut may be produced, as in the scalp. The evidence in the case above is very unsatisfactory from this point of view. A girl, æt. 6, fell from a tree with her legs apart upon one of the sharp-pointed shoots below, about half an inch thick. This entered the vagina, and passing through its posterior wall, broke off. A woman removed the wood with some difficulty. The child died in twenty-eight hours from peritonitis (*Lancet*, 1871, 2, 74). Had this child been found dead with the wood in her body, there might have been some difficulty in assigning an accidental origin to such an injury. For remarks on wounds of the male genital organs see "Ann. d'Hyg.," 1868, 2, 110, Toulmouche. Some rules which have been elsewhere given may enable a witness to form an opinion when a question of this kind is involved in doubt. For cases in which such wounds were homicidally inflicted upon males see "Ann. d'Hyg.," 1848, 1, 443, also 1865, 1, 156; and for a case which led to a trial for the murder of a woman see *Med. Gaz.*, vol. 44, p. 813.

Contused Wounds on the female genitals sometimes prove fatal by the laceration of parts leading to great loss of blood. Several trials for manslaughter have taken place in which this was proved to have been the cause of death (*Reg.* v. *Cawley*, Liverpool Wint. Ass., 1847; *Assoc. Med. Jour.*, June 28th, 1856, p. 538). There may be such a loss of blood in these cases as to destroy life, although no large bloodvessel is implicated in the injury. A contused wound on the vulva may occasionally present an ambiguous appearance, and be mistaken for an incised wound. When the soft parts of the body are struck by a blow or kick, if there is a bony surface beneath, a longitudinal rent may appear as a result of the force being received by the bone. A kick on the vulva, or a fall on this part, may produce an injury of this kind, and, unless carefully examined, may lead to the inference that a weapon has been used for its production. A contused wound of the clitoris proved fatal (*Lancet*, October 31st, 1846, p. 478).

A woman, æt. 36, received a kick from her husband in the lower part of the abdomen while she was in a stooping posture. When seen in about three-quarters of an hour, she had lost from three to four pounds of blood. She was sinking, and expired a few minutes afterwards. On inspection there was no injury to the uterus or vagina; the wound was situated at the edge of the vulva, extending from the pubes along the ramus of that bone. It was about an inch long and three-quarters of an inch deep. The left crus clitoridis was crushed throughout its length, so as to exhibit its cavernous structure. From this the fatal bleeding had proceeded. The heart and great vessels contained no blood. The bleeding from such injuries is always likely to be more profuse, but is not always fatal, when the woman is pregnant (*Med. Times*, May 15th, 1847, p. 233).

Some women are subject to frequent discharges of blood from the genital organs from natural causes. When the bleeding immediately

follows a blow, and the woman has not been subject to such a discharge, the fair presumption is that violence was the cause; but when the flow of blood appears only a long time after the alleged violence, of which no traces can be seen, it is most probably due to natural causes. In one case of this kind there was no difficulty in giving an opinion that the flow of blood was *not* due to violence.

It may be alleged in defence that the injuries found on the body were inflicted *after death*, and not while the deceased was living. Kicks or blows on the vulva, if they destroy life at all, cause death by copious effusion of blood. Violence to this part after death would not produce such an effusion as would account for death. There are also other distinguishing characters which have been elsewhere pointed out (see "Before or after Death"). A case was tried in Edinburgh in which this defence was set up; but Simpson was enabled to say, from his observation of the effects of such violence to a dead body, that the injuries in question could not have been produced after death.

FRACTURES.

Fractures of the bones have some important bearings in relation to medical jurisprudence. They may result from falls, blows, or the spontaneous action of the muscles.

Causes.—Questions are sometimes put as to whether a particular fracture was caused by an accidental fall or blow, and if by a blow, whether by the use of a weapon or not. It is obvious that the answers must be regulated by the circumstances of each case. In examining a fracture it is important to determine, if possible, whether a *weapon* has or has not been used, and this may be sometimes ascertained by the state of the parts. It is a common defence on these occasions to attribute the fracture to an accidental fall. Fractures more readily occur from equal degrees of force in the old than in the young, and in the young rather than in the adult, because it is at the adult period of life that the bones possess their maximum degree of firmness and solidity. The bones of aged persons are sometimes very *brittle*, and slight violence will then produce fracture. This has been regarded as an extenuating circumstance when the fracture produced by a slight blow was followed by death. Certain diseases, such as syphilis, arthritis, cancer, scurvy, and rickets, render bones more fragile; but they are sometimes preternaturally brittle in apparently healthy persons, and this brittleness appears to be hereditary. This *fragilitas ossium* has already been considered (*vide ante*, "With what Weapon inflicted?").

In the *B. M. J.*, vol. 1, 1904, p. 1018, is recorded a case occurring in a man, æt. 42, probably suffering from tabes dorsalis. In such cases a defence might fairly rest upon an abnormal condition of the bones, providing the violence producing the fracture was slight. Several trials have taken place in which this brittleness of the bones became a subject of inquiry. In a case of fractured skull leading to death from inflammation of the brain, it was proved that the bones of the skull were occasionally thin and brittle, and this led to a mitigation of punishment. In *Barnett* v. *Roberts* (Court of Exch., November, 1867), an action was brought for injury resulting from an assault by the defendant.

It appeared from the evidence that the defendant struck the plaintiff two violent blows on the head with the handle of his umbrella. It was alleged that this had caused a fracture of the skull, and had produced a long and painful illness. Erichsen and Forbes Winslow gave evidence for the plaintiff to the effect that in their judgment the skull was fractured, the brain organically injured, and the plaintiff's recovery rendered practically hopeless. For the defence Partridge, Wood, and other witnesses, deposed that the skull was not fractured; that the depression supposed to indicate the fracture was congenital, and not the result of a blow or accident. A skull with a natural depression in it was produced and shown to the jury. The plaintiff's head was examined in court by Partridge. He could feel no cicatrix in the alleged seat of injury, but there was a thickening over the depression. On this evidence the jury could not agree. Even if there had been a cicatrix on this occasion, this would not have proved that the skull had been fractured. The injury to the brain might well have been a result of the violence, although there had been no fracture.

In a case in which there is no appearance of disease, a fracture may be ascribed to spontaneous causes. Thus, bones have been fractured by moderate muscular exertion.

The elbow (olecranon), heel-bone (os calcis), and knee-pan (patella), are particularly exposed to this accident. The long bones are seldom the subject of an accident of this kind; but the arm (humerus) in a healthy man has been broken by the simple muscular exertion of throwing a cricket ball (*Med. Gaz.*, vol. 16, p. 659). A young lady fractured the neck of the scapula by suddenly throwing a necklace round her neck (*Med. Gaz.*, October, 1842). In 1858, a man, æt. 40, was in the act of bowling at cricket, when on delivering the ball he and some bystanders heard distinctly a sharp crack, like the breaking of a dry piece of wood. He fell to the ground as if he had been shot. The thigh-bone was found to be fractured, evidently from muscular exertion only. In 1871, while a strong young member of the Scottish volunteers was in the act of "putting" a sixteen-pound shot, making at the time a violent effort, he felt something snap in his arm and instantly lost all power over it. It was found, on examination, that the humerus had been broken by muscular force. No person can meet with an accident of this kind without being instantly conscious of it. It is probable that in these instances, if there were an opportunity of examining the bone, it would be found to have undergone some change in its composition, which had rendered it brittle. A case of spontaneous fracture of the femur was brought into Guy's Hospital in 1846. A healthy man, temperate, æt. 33, was in the act of placing one leg over the other to look at the sole of his foot, when he heard something give way, and the right leg immediately hung down. It was found that the right thigh-bone had been transversely fractured at the junction of its middle with the lower third. This case is remarkable, inasmuch as spontaneous fractures of the thigh-bones are very rare, as the man had not suffered from any of those diseases which cause preternatural fragility, and the fracture was not caused by violent muscular exertion. The actual condition of the bone was of course unknown; but it healed readily, and the man left the hospital at the usual period.

In fractures arising from this cause there will be no abrasion of the skin, nor any appearance to indicate that a blow has been struck; while the marks of a blow would, of course, remove all idea of the fracture having had a spontaneous origin. It is most unusual that the ribs should be fractured from muscular exertion; but a case occurred which shows that this accident may readily occur. The patient was a strong healthy labourer, æt. 45, who, slipping while walking, only saved his footing by the exertion of considerable strength. While recovering his balance he felt a sharp pain on his right side, which was aggravated by inspiration and by exertion, so that he reached home with difficulty. On examination, a tender spot of about half a hand's breadth was found in the axillary region over the seventh and eighth ribs. Crepitation was not distinct, and emphysema was not present. As the pain

occurred so suddenly, and was limited to so small a space, it was supposed that a rupture of the muscular fibres had taken place, although the absence of all swelling and effusion, as well as of any depression amidst the fibres rendered this not very probable. Pleurisy was set up, and the patient was confined to bed for a fortnight; when all traces of pain had left the part, the deposition of callus (new bone) plainly showed that there had been fractures of the seventh and eighth ribs ("Archiv. der Heilk.," vol. 1, p. 473; also *Med. Times and Gaz.*, 1861, 1, p. 450).

Fractures are not *dangerous to life*, unless, when of a compound nature, they occur in old persons, or in those who are debilitated by disease or dissipated habits. They may then cause death by irritative fever, erysipelas, gangrene, tetanus, pyæmia, or delirium tremens being set up.

Fractures in the Living and Dead Body.—It is not always easy to say whether a fracture has been produced *before or after death*. A fracture produced shortly after death, while the body is warm, and another produced shortly before death, will present similar characters, except that in the former case there might be less blood effused. A fracture caused ten or twelve hours before death would be indicated by a copious effusion of blood into the surrounding parts and between the fractured edges of the bones, as well as by laceration of the muscles; or if for a longer period before death, there may be the marks of inflammation. Fractures caused several hours after death are not accompanied by an effusion of blood. A medical witness may be asked, How long did the deceased survive after receiving the fracture? This is a question which can be decided only by an examination of the fractured part. Unless the person has survived eighteen or twenty-four hours there are commonly no appreciable changes. After this time lymph is poured out from the surrounding structures. This slowly becomes hard from the deposition of "callus" (new bone). In the process of time the callus acquires all the hardness of the original bone. The death of a person may take place during these changes, and a medical man may then have to state the period at which the fracture probably happened, in order to connect the violence with the act of a particular person. Unfortunately we have no satisfactory data, if we except the extreme stages of this process of repair, upon which to ground an opinion. We can say whether a person lived for a long or a short time after receiving a fracture, but to specify the exact time is clearly impossible, since this process of restoration in bone varies according to age, constitution, and many other circumstances. In young persons bones unite rapidly, in the old slowly, in the diseased and unhealthy the process of union is slow, and sometimes does not take place at all. In those who are at the time affected with a mortal disease there is no attempt at reparation. According to Villermé, the callus assumes a cartilaginous structure in from sixteen to twenty-five days, and it becomes ossified in a period varying from three weeks to three months. It requires, however, a period of from six to eight months for the callus to acquire all the hardness, firmness, and power of resisting shocks possessed by the original bone. A force applied to a recently united bone will break it through the callus or bond of union, while after the period stated the bone will break as

readily through any other part. It is generally assumed that the period required for the union of a simple fracture in a healthy person is, for the thigh-bone, six weeks; for the tibia (leg), five weeks; for the humerus (arm), four weeks; and for the ulna and radius (forearm), three weeks; for the ribs, about the same period; but cases have been known in which the ribs had not perfectly united in two months, and in some fractures of the other bones it was found that union had not taken place in four months. In a case which occurred to Reid, a fracture of the tibia, the principal bone of the leg, had healed in thirty-one days. The Röntgen rays have recently come very much to the assistance of the medical jurist, enabling him not only to establish with certainty the absence or presence of bony union in an admitted fracture, but to go farther than this and establish or disprove the presence of an alleged fracture. The method is not without some little risk of skin irritation, which may be difficult to heal, of which many cases have already been reported in the journals. It is also open to a good deal of unscrupulous "faking" in the preparation both of the negative plate and the printed photograph, so much so that it is eminently desirable that X ray photographs should be taken by a disinterested witness, or that the operators on the two sides should join in the process and agree beforehand on the details. These remarks apply especially to those cases in which it is alleged that a deep-seated bone—the spine, for instance—has a process broken off it.

Has a Bone ever been Fractured?—This question is sometimes put in reference to the *living* body. It is well known that a bone seldom unites so evenly that the point of bony union is not indicated by a node or projection. Some bones are so exposed as to be well placed for this examination, as the radius, the collar-bone, and tibia; these being but little covered with skin; in others the detection is difficult. It is impossible for us to say when the fracture took place; it may have been six months or six years before, as, after the former period, the bone undergoes no perceptible change. These facts are of importance in relation to the *dead* as well as to the living, since they will enable us to answer questions respecting the identity of skeletons found under suspicious circumstances, and here medical evidence may take a wider range, for a fracture in any bone may be discovered, if not by external examination, at least by sawing the bone longitudinally through the suspected broken part, when, should the suspicion be correct, the bony shell will be found thicker and less regular in the situation of the united fracture than in the other parts. So, in such cases, it will be easy to say whether a fracture is recent or of old standing.

Locomotion.—With respect to the power of *locomotion* after a fracture, it may be observed that, when the injury is in the arm or in the ribs—unless many of them are broken or the fractures are on both sides—a person may be able to move about, although unfitted for struggling or making great exertion. Fractures of the leg generally incapacitate persons from moving except to short distances. See case, *Ed. Med. and Surg. Jour.*, October, 1836, p. 252; also another in which one bone of the leg was fractured, and a power of walking some miles was retained (*Amer. Jour. Med. Sci.*, October, 1845, p. 484).

Dislocations.

Dislocations are not frequent in the old or in those persons whose bones are brittle. They rarely form a subject for medico-legal investigation. A witness is liable to be asked, what degree of force, and acting in which direction, would produce a dislocation, questions not difficult to answer. They are not dangerous to life, unless of a compound nature, when death may take place from secondary causes. A dislocation which has occurred in the *living body* may be known after death by a laceration of the soft parts in the neighbourhood of the joint, and by the copious effusion and coagulation of blood. For an account of the appearances presented by a dislocation of the shoulder four days before death, see *Med. Gaz.*, vol. 31, p. 266). If of old standing, a dislocation would be identified by the cicatrices in surrounding structures. Dislocations may occur from *natural causes*, as from disease and destruction of the ligaments in a joint; also from violent muscular spasm during an epileptic convulsion. Dymock met with an instance of dislocation of the shoulder forwards during puerperal convulsions (*Ed. Med. and Surg. Jour.*, April, 1843, p. 382; see also *Lancet*, April, 1845, p. 440). A power of *locomotion* may exist, except when the injury is in the lower limbs; but it has been observed that, for some time after a dislocation of the hip-joint, considerable power over the limb remains; it is only after a few hours that the limb becomes fixed in one position. Exertion with the dislocated member is in all cases out of the question. A few further remarks on fractures and dislocations will be found under "Malpraxis."

SELF-INFLICTED WOUNDS OF A NON-FATAL CHARACTER.

The question whether a wound was or was not self-inflicted may refer to the living as well as to the dead. Thus, a man may produce wounds upon himself for the purpose of simulating a homicidal assault, which, for various motives, he may allege to have been committed upon him. With the motives for the self-infliction of wounds a medical jurist is not concerned—it is of the fact only that he can take cognisance. One of the most remarkable cases of this kind which have occurred in England was that of Bolam, who was tried for the murder of a man named Millie, at the Newcastle Autumn Assizes, 1839.

Bolam was found lying in an apartment which had been fired by himself, or, as he alleged, by some incendiary, and near him was the body of the deceased, who had evidently been killed by violence—the skull having been extensively fractured by a poker lying near. The prisoner, when found, was either insensible or pretended to be so. He stated that he had been suddenly attacked by a man, and knocked down by a blow on the right temple. After attempting to escape, he was again knocked down. He then felt a knife at his throat, but admitted that he did not put up his hands to protect it. His hands were not cut. He said he remembered receiving some blows on his body, but he became insensible and recollected nothing more. On examining his throat, there was a wound an inch and a-half in length on the left side of the neck, a quarter of an inch below the jaw. It had penetrated nearly through the true skin, and was of inconsiderable extent. A small quantity of blood, which had flowed down on the inside of his cravat, had escaped from this wound. There were many cuts on his coat at the back and sides, through his waistcoat, shirt, and flannel shirt, but there were no corresponding cuts or stabs, nor, indeed, any marks of injury upon the skin. The question was whether these wounds were

inflicted by the unknown person, who was alleged to have fired the premises and murdered the deceased, or whether the prisoner had inflicted them on himself, in order to divert attention and conceal the crime which he was accused of having committed. No motive for the imputed crime was discovered; but the medical facts relative to the self-infliction of wounds were so strong that he was convicted of manslaughter. There was no doubt that the prisoner had produced the wounds upon himself in order to remove the suspicion that he had caused the death of the deceased. They were superficial, involved no important organs, and bore the characters which those wounds only would have, which had not been produced with a suicidal intention.

Soon after Bolam's case one somewhat similar occurred in London.

The steward of a club-house was found one morning in bed wounded, and the cash-box of the club was missing. Circumstances led the police to suspect that no one could have broken into the house; but the man himself was considered so trustworthy that no suspicion was entertained of his having been concerned in the robbery. Bransby Cooper, who examined him, found the wounds on his person of a trivial character; and there was no doubt from what subsequently transpired, that he had produced them on himself, for the purpose of averting suspicion.

It is not always easy to trace a motive for the production of these injuries; and when a reasonable motive is not immediately discovered, persons are apt to be misled and to credit the story. When a person intending to commit suicide fails in the attempt, he has sometimes, under a sense of shame, attributed the infliction of a wound in his throat to another; but facts of this kind may without difficulty be cleared up by circumstantial evidence. Imputed wounds, if we except the case of an actual attempt at suicide, in which the injury is commonly severe, are generally of a *superficial* character, consisting of cuts or incisions not extending below the true skin; deep stabs are seldom resorted to where the purpose is not suicide, but merely to conceal other crimes. Further, these wounds are in *front* of the person, and may be on the right or left side, according to whether the person is right or left-handed. They have also been generally *numerous*, and widely scattered; sometimes they have had a complete parallelism, unlike those which must have been inflicted by an adversary during a mortal conflict with a weapon. The *hands* are seldom wounded, although in the resistance to real homicidal attempts, these parts commonly suffer severely. The injuries are not usually situated over those parts of the body in which wounds are by common repute considered *mortal*, and there is in general an entire want of correspondence between the situation of the wounds on the person, and the cuts or other marks on the *dress;* or the cuts in the dress are not reconcilable with the articles of dress having been worn when they were produced. Facts of this kind require special attention. In a case which occurred to Marc, a young man alleged that he had received a sword-cut on the forehead from some assailant who had escaped. He stated that he wore at the time a handkerchief round his head, a cotton cap, and a common cap with an elastic front, which he alleged had been cut through. There was a longitudinal wound, quite superficial and about an inch long, at the upper and right part of the frontal bone, passing downwards from *left to right*. The cut in the felt of the cap, which was very soft, passed obliquely from *right to left*, and was about three inches in length. The cut was not so clean or regular as if it had been produced by a sword; there was very little blood upon the cap, and only on the edge of the incision. The silk handkerchief was cut in an irregular manner.

When the person was requested to place the cap and other articles upon his head in the position in which he stated they were when he was attacked, it was found to be impossible to adjust them so as to make the incisions correspond, and the cap could not be worn over the folded handkerchief. This rendered it certain that the wound had not been inflicted in the manner described. Besides, a blow of a sword which would have divided the felt and silk handkerchief would at the same time have produced a much deeper wound on the forehead than that which was found.

In comparing cuts on the *dress* with wounds on the person there are several circumstances to be attended to. What articles of dress were worn at the time of the assault? In a case of stabbing all ought to present marks of perforation, corresponding in direction, form, size, sharpness of the edges of the weapon, etc. In imputed wounds the marks on several layers of dress may not correspond with each other in the characters above mentioned. It is very difficult for a man simulating such injuries so to arrange his clothes when off his person as to deceive a careful examiner. There will be some inconsistency or want of adjustment. Apart from the fact that several stabs or cuts cannot exist on the same part of the clothes without one or more being stained with blood on the outside or inside, an impostor may either do too much or too little, and thus lead to his detection (case of Wiggins). In a case of alleged arson to defraud a fire insurance company, which excited much public discussion in London many years since, a simple circumstance led to the inference that certain stabs or cuts through a shirt had not been produced while the shirt was on, but while it was off the body. There were two cuts in the shirt near to each other, precisely similar in size, form, and direction; in fact, the knife or dagger producing them must have gone through a fold of the shirt to produce them, so accurate was the correspondence. Then, however, it followed that the shirt could not have been upon the body of the wounded person as he alleged, because a stab through a shirt when worn over the skin must, in order to reach the body, traverse not only a fold (producing two cuts), but another layer in contact with the skin, and thus produce *three cuts*, or in the event of traversing two folds, *five cuts*. In simulating the wounds by cuts on the shirt, the person is supposed to have forgotten this and have merely stabbed a fold of the shirt while lying on a table, or in some situation convenient for the purpose. This, among other facts, rendered it probable that the slight wounds on the chest were self-inflicted. A case occurred at Nottingham in 1872, which shows how persons who inflict wounds and at the same time cut the dress covering the wounded part may furnish evidence against themselves. A youth charged a man with unlawfully wounding him on the highway. He stated that the man had stabbed him in the arm, cutting through his shirt and coat-sleeve. There was no attempt at robbery, and no motive for such an act. On examining the coat and shirt-sleeve it was found that they had been cut, but there was no corresponding cut in the lining of the coat-sleeve. The prosecutor could give no explanation of this. It was clear that the charge was false, that there had been no cutting or stabbing by another, but that the wound was self-inflicted, when the coat was not worn.

It has been contended that no rules can be laid down for the detection of such cases; each must be decided by the facts which accompany it. Nevertheless, the details of those above mentioned will serve to direct the inquiries of a practitioner. The facts which he must endeavour to ascertain are the following:—

1. The relative positions of the assailant and the assailed person at the time of the alleged attack.

2. The situation, direction, and depth of the wound or wounds.

3. The situation or direction of marks of blood or wounds on the person or dress of either, or of both the assailant and assailed.

4. The marks of blood, and the quantity effused at the spot where the struggle is alleged to have taken place.

The importance of these inquiries cannot be over-estimated. A strong suspicion was raised against the late Duke of Cumberland, in the year 1810, in reference to the death of Sellis, when a proper examination of the wounds on the deceased would have shown that they might have been self-inflicted.

Imputed wounds are generally *cuts* or *stabs*. They are seldom of the contused kind; the impostor cannot, in reference to contusions, so easily calculate upon the amount of mischief which is likely to ensue. Bergeret, however, has related some cases in which females labouring under hysterical attacks have inflicted upon themselves severe contusions, and have charged innocent persons with attempts to murder ("Ann. d'Hyg.," 1863, 1, 463). In general the inconsistency of the story is so palpable as to betray the imposture at once.

The case of M. Armand, a merchant of Montpellier, who was tried at the assizes at Aix, in March, 1864, for an alleged murderous assault upon his servant, Maurice Roux, shows the readiness with which inconsistent stories are sometimes accepted by the public. This case was rather one of imputed homicidal strangulation than imputed wounding; nevertheless a foundation was laid for medical opinions by the presence, as it was alleged, of a slight excoriation of the skin on the nape of the neck. The injury was so slight that it escaped the observation of some medical men who examined the complainant, and there could be no doubt from the facts that it had been produced either accidentally or designedly by the complainant on himself. Several medical men, taking the man's story as true, asserted without any qualification: 1. That a blow on the nape of the neck might produce cerebral concussion and syncope; 2. That a blow to produce such effects need not be violent; and 3. That such a blow so inflicted would not always leave upon the skin marks of contusion or ecchymosis. These admissions were taken by the court to support the man's story—that his master struck a severe blow on the back of his neck, and this had produced concussion of the brain, and that he had been rendered insensible for many hours ("Ann. d'Hyg.," 1864, 1, 451). The evidence for the defence, and chiefly that given by Tardieu, removed the effect produced by such loose medical answers as these, and satisfied the jury that the statement of the complainant was a pure fabrication. The accused was justly acquitted of the charge.

Although it has been elsewhere stated that severe blows are not always attended with external marks of violence (*vide* "With what Weapon Inflicted?"), it by no means follows that such blows have been struck in all cases in which the skin presents a slight abrasion.

Another case of some importance, in which a man was tried and convicted of the murder of a woman living with him as his wife, was the subject of a trial (*Reg.* v. *Wiggins*, C. C. C., September, 1861).

The woman was found dead with a wound in her throat which divided the carotid artery, the internal jugular vein, and the windpipe. It commenced on the

left side far back, penetrating as by a stab perpendicularly towards the spine, the bones of which had been indented by the violence of the blow. Death must have speedily followed. There was a wound on the neck of the prisoner, commencing on the left side, going in a direction from left to right and from above downwards. It was quite superficial, involving only the skin and the external jugular vein. The prisoner alleged that the deceased had cut his throat while he was lying on the floor asleep, and that she had afterwards destroyed herself. A close examination of these wounds showed that on the prisoner's neck there was a superficial cut such as a man might easily produce on himself, while the wounds on the neck of the woman were such as were not likely to have been self-inflicted. There were many circumstances in this case which only admitted of explanation on the theory that a murderous assault had been committed on the woman by the prisoner, and that he had subsequently inflicted the wound in his own neck, to give some plausibility to the story that his wife had attempted to murder him while he was lying asleep. He gave two accounts of the transaction not consistent with each other, nor with any of the facts proved in the case. Among the circumstances which were inconsistent with his statement was the following:—He produced a neckerchief which he said he wore while lying down, and showed the constable a cut in it which, according to him, was produced by the deceased while attempting to cut his throat. The neckerchief was of thin red cotton in sixteen folds. It was nearly tranversely cut across the folds, the edges clean and sharply cut, and neither stained nor stiffened with blood. It could not be made to correspond in any way to the cut in the neck. It was nearly at right angles to it, and on the opposite side of the neck as it was worn. It was obvious, from a close examination, that the cut must have been made on this neckerchief when it was not upon the neck, and with a clean knife.

For a full account of this singular case, which presented points of interest in reference to the probable time of death, the attitude of the body, the power of locomotion and exertion after a wound of the carotid artery, the jugular vein and trachea, and the medical inferences from bloodstains on clothing, the reader is referred to a paper in Guy's Hosp. Rep., 1869, p. 112.

A very obvious case of self-inflicted wounds is reported at the Lancaster Assizes, July, 1896 (*Reg.* v. *Hindle*). The prisoner was indicted for the murder of Sarah Coates, æt. 61. Prisoner arrived at the victim's house at 9 a.m., and between then and 10.15 the crime occurred. The accused and the victim were alone in the house. Prisoner alleged that he found a strange man strangling the victim, but, being disturbed by the prisoner, he slashed her throat and disappeared. Before he did so, however, the prisoner seized him by the coat tails, when the strangler drew his knife across the prisoner's arm, making seventeen or eighteen cuts. Blood was found in parts of the house and in the street, in directions different to the way the strangler was said to have escaped, while there was none the way he was said to have gone. It was shown that no one passed through the back way as alleged, and that not a single cry of "Murder" was heard, although prisoner said that he had cried out several times as he pursued the escaping man. A careful examination showed that no one had passed over the door, for the dust had not been disturbed, and there were no scratches upon it. There was not a single thing to indicate to the police or the doctors that the door had been touched in any way. There was strong evidence that the prisoner's story was incorrect. Instead of pursuing a man along the back passage, the prisoner was seen to come out of the front door, and turn into the passage leading to the back door. Downstairs, in the front shop, were drops of blood, showing the exact course taken by the prisoner. The woman had been undoubtedly throttled. She was a weakly person,

somewhat less than the prisoner. The actual cut upon the throat had been inflicted by a knife belonging to the deceased's son, the whereabouts of which could not be known to a stranger, and as it was of peculiar construction it was hardly likely that it could be used by a stranger. It was in the son's bedroom, and to get possession of it a person would have to go through the sitting-room. The suggestion of the prosecution was that the whereabouts of the knife and its peculiar construction was known to the prisoner, and that he used it for the purpose of murdering Mrs. Coates. Dealing with the motive for the crime, Mr. M'Keand said Mrs. Coates was a charitable woman, and had some money put away for charitable purposes in a drawer in the bedroom. Money had been missed on several occasions, although there was no one in the house except Mr. Coates, the deceased woman, their son Thomas, and the prisoner. Money had actually been missed on the morning of the murder.

Dr. Clayton, Accrington, said prisoner came to his house on the morning of the 9th of June, and said a murder had been committed at Coates' shop. Witness accompanied the lad to the house, and on the way he said the murder had been committed by a strange man, of whom he gave a description. He found the body of Mrs. Coates in the room, a yard from the door. The lips were blue, and the face livid. The cut across the throat was about three inches long, and it did not strike him as being very deep. She was in a dying state, and all she could say in answer to the question, "Who has done it?" was "Turn me over, turn me over." Twice she said "Nobody." He concluded she had been strangled, by means of a scarf which had been twisted round her neck, into unconsciousness, and that then her throat had been cut. There were twenty or thirty cuts on the boy's arm, scratches in fact, but he did not form any opinion as to how they had been done; he did not then doubt the boy's word.

Dr. Monaghan, Accrington, spoke to examining prisoner's arm, and finding fourteen scratches and two wounds on the right forearm. Speaking generally the scratches were parallel. He formed the opinion at the time that the injuries were self-inflicted, but that opinion did not amount to a certainty.

Dr. Geddy said he had made a post-mortem examination of the body. Death was caused by hæmorrhage, the result of an incised wound on the throat. There were also signs that she had been strangled previous to the throat being cut. There was a bruise on the left temple, two on the throat—probably caused by the throat being grasped by the finger and thumb—and one on the left side. Some abrasions might have been caused by the finger nails of someone standing in front of her and grasping her by the throat. The incised wound was about three and a-half inches long, the right side being deeper than the left. It was about an inch deep, and might have been caused by the knife produced. Witness examined the boy at the police station at noon on the same day, and found several transverse scratches on the right forearm. In witness's opinion the scratches could not have been caused by a second person in a struggle. If a man was striking at random with a knife he could not produce seventeen parallel wounds on a person's arm. The nature and character of the wounds were quite inconsistent with the boy's story, and might have been

self-inflicted. In cross-examination, witness said the external jugular vein of Mrs. Coates' neck was severed, and would bleed freely.

Of the nineteen cuts on prisoner's arm, one doctor stated that seventeen were mere scratches, that only two had really pierced the skin, and that they had evidently been self-inflicted. Another doctor said that the wounds were wholly inconsistent with the suggestion made by the prisoner, that he had been trying to stop the escape of a murderer. The suggestion of the prosecution was that the boy had wickedly devised that plan in the hope of deluding everyone that he had not committed the crime himself. It was a painful thing to see a child fifteen years of age in the position of prisoner.

Dealing with the prisoner's story that the unknown man had inflicted the wounds upon his (prisoner's) arm in his endeavour to escape, his lordship said it was incredible that a man who had risked everything for the purpose of committing murder would only have inflicted scratch wounds upon a person who endeavoured to prevent his escape. He would not have hesitated to commit another murder when it was necessary for his own safety. None of the furniture in the room had been upset or disturbed.—Mr. Ambrose Jones: There was nothing to show that a struggle had taken place?—Witness: Nothing whatever, except that the carpet that she was on was a little ruffled.

SECTION VII.

SUB-SECTION B.

GUNSHOT WOUNDS.

1. THE STATUTORY LAW ON THE SUBJECT.
2. DIAGNOSIS OF A GUNSHOT WOUND.
3. WHEN WAS THIS WOUND INFLICTED?
4. WAS IT BEFORE OR AFTER DEATH?
5. IS THIS WOUND DANGEROUS TO LIFE?
6. AT WHAT DISTANCE WAS THE FIREARM DISCHARGED?
7. HOW WAS THE WOUND INFLICTED?
8. WAS IT ACCIDENT, SUICIDE, OR HOMICIDE?
9. IDENTITY FROM THE FLASH OF A FIREARM.
10. IMPUTED WOUNDING BY FIREARMS.
11. WHEN WAS THIS WEAPON DISCHARGED?

1. The Law on Gunshot Wounds.

The law on the subject is governed by the same statute as that on ordinary wounds, viz. 24 & 25 Vict. c. 100.

Sect. 14 says: "Whoever . . . shall shoot at any person or shall be drawing a trigger or in any other manner attempt to discharge any kind of loaded arms at any person . . . with intent . . . to commit murder shall, whether any bodily injury be effected or not, be guilty of felony."

Sect. 18 says: "Whoever shall . . . by drawing a trigger or in any other manner attempt to discharge any kind of loaded arms at any person with intent . . . to maim, disfigure, or disable any person, or to do some other grievous bodily harm to any person, . . . shall be guilty of felony."

Sect. 19 says: "Any gun, pistol, or other arms which shall be loaded in the barrel with gunpowder or any other explosive substance and ball shot, slug, or other destructive material shall be deemed to be loaded arms within the meaning of this Act, although the attempt to discharge the same may fail from want of proper priming or from any other cause."

Sect. 28 refers to the explosion of gunpowder, and would cover a gun loaded with powder only.

In 1839 and 1840 cases occurred in which the projectile was not found; it was even then held that such was not necessary to constitute the crime. The judge held that the circumstances were sufficient to warrant the jury in inferring that the deceased had been struck by some substance from the gun, which had caused his death; and it was not necessary to prove whether this had been done by leaden shot or pellets.

Now Sect. 14, as above, carries the matter much farther, and says that even a wound is unnecessary. If, therefore, there be no wound, it may be very important to determine whether a firearm have recently been discharged (*vide infra*, "When was this Weapon Discharged?"). If, on the other hand, a wound or wounds have been produced either in a living or dead body, it is easy to conceive of circumstances in which there may be no direct evidence apart from the wound that it was a firearm that produced it or them. We must, therefore, consider what are the special characters of a wound thus inflicted.

2. Diagnosis of a Wound Produced by Firearms.

It is not, under circumstances calling for medico-legal investigation, easy to mistake a firearm wound for any other injury. In the *Med. Gaz.*, vol. 44, p. 767, will be found an account of a case where a wound of the skull inflicted with a red-hot poker produced in the bones a small, sharply defined circular opening which bore a close resemblance to a bullet wound; but, with only one wound and no projectile found, it was easy to say that it had not been done by a bullet.

If only a superficial bruise or abrasion be found, it is impossible to say that a firearm caused it.

If a wound or wounds have been produced by a missile from a firearm, it may be laid down as a mathematical law that there must be from each such missile either an odd or an even number of wounds. If an odd number have been produced (*vide* p. 564 for an exception where the missile splits into fragments), it follows that the missile must be still in the wound, and a careful search must reveal its presence and nature sooner or later if the person be dead. If he be still alive, an X-ray photograph will detect it for a certainty if it be metallic: if it be non-metallic, and the patient survive, it may be possibly discoverable by palpation; and if not, it is beyond the reach of medical evidence, unless it be discharged from the wound in the processes incident to inflammation, when it can be examined.

If there be an even number of wounds, then some of these must bear the characters of wounds of entrance, and some those of wounds of exit. Commonly with bullets there is, of course, only one wound of entrance and one of exit. Should there be more than one of each sort, and only a single bullet was fired, the position of such wounds affords valuable evidence of direction (*vide infra*). With shot guns, naturally, multiple wounds are much more common. The contrast between the wound of entrance and the wound of exit is the most important means we have of determining the fact that given wounds were caused by firearms, but there are other points applicable to some cases. For the sake of completeness, we may tabulate the points of evidence thus:—

(1.) Direct evidence of eye-witnesses.

(2.) Indirect evidence of sounds of a shot being fired.

(3.) Finding the missile in the person or room, etc.

(4.) Finding the associates of the missile (powder, wadding, etc.) in the wound.

(5.) The contrast of wound of entrance with that of exit.

(1) and (2) admit of no discussion from a medical point of view.

(3) has already (*supra*) been sufficiently considered.

(4) is better discussed under the heading of "At what Distance was the Shot fired?" (*vide infra*).

(5.) With the invention of conical bullets, rifled weapons, and nitro-powders, the velocity and penetrating power of projectiles have so enormously increased that there is now in many cases (reported by military surgeons chiefly) some considerable difficulty in distinguishing the wound of entrance from that of exit and, indeed, in asserting positively that a wound was caused by a bullet at all when the rifle was at a distance of anything between three or four yards and a mile or so. (*Vide Lancet*, 1, 1900, p. 111.)

There is consequently a very clear distinction to be drawn between the wounds caused by high velocity weapons and those produced by ones of low penetrating power, such as pistols and sporting guns; but, as the majority of cases requiring medico-legal investigation are produced by these latter, it is of very great importance that the medical witness should be acquainted with the ordinary type of case.

The Wound of Entrance.—This in the average case is comparatively small; it may appear to be smaller than the missile owing to the elasticity of the skin (*vide* p. 420), with edges more or less inverted and bruised or lacerated, scorched or not, and possibly surrounded with the small petechiæ of powder, according to the distance of the weapon (*vide infra*, "At what Distance Fired?").

If the muzzle of the piece was not in immediate contact with the part struck, the wound is rounded; but if there has been direct contact, the skin, besides being burnt, is torn and much lacerated. The bleeding is usually slight, and when it occurs it is more commonly observed from the orifice of exit than from that of entrance. The aperture of entrance is round only when the bullet strikes point-blank, or nearly so; if it should strike obliquely, the orifice will have more or less of an oval or valvular form.

The Wound of Exit is commonly larger, often many times larger, than the wound of entrance; it is irregular and with everted edges, and will be free, under any circumstances, from burning and from powder particles; it is commonly much lacerated and irregular.

It is easy to see why these differences should exist, for a bullet is in reality a small bruising or crushing force, with very great power in it; it will therefore have a tendency to force in front of it a core of tissue which increases in diameter. Again, the skin of the wound of exit is unsupported (*cf.* starred fractures of the skull), and yields with a tearing as opposed to a cutting force. It is not, however, quite so easy to understand the curious exceptions that are proved on the most positive evidence to occur now and again.

A boy was shot in the neck by the accidental discharge of his gun, loaded with an ounce of No. 8 shot. He died instantly. He was leaning forwards on the muzzle, so that it was nearly in contact with the skin of the neck. A large round hole was produced, one inch and a half in diameter, the edges of which were slightly blackened with powder. The exit aperture, which was at the back of the neck, a little to the left of the third cervical vertebra, was a mere slit in the skin, scarcely an inch long, with the long diameter placed vertically. The smallness of this aperture may have been owing to the greater part of the chargo being lodged in the body. The entrance aperture, although rounded, was too large to be

mistaken for a bullet wound; it was evidently a near wound, from the blackening of the edges.

In October, 1891, a patient in Guy's Hospital shot himself through the heart with a pistol and died at once. The aperture of exit was smaller than that of entrance.

With a small crushing force it naturally follows that the lower its velocity and power, provided that it has sufficient of both to penetrate at all, the larger the wound, because the elasticity of the skin and other tissues has more time and opportunity to come into play, with consequent greater tearing. It is the same with the aperture in the dress when this is formed of elastic material. Should the dress be pushed in front of the projectile into the wound, it will again cause an increase in the size of the wound naturally.

In the *Lancet*, p. 1236, vol. 1, 1904, is a case recorded by Dr. von Frisch, of Vienna, in which the stomach was wounded by a bullet in which the wound of exit was smaller than that of entrance, and in connection with the case Von Frisch stated that he had confirmed the fact that this occurred by numerous experiments on animals.

Messrs. Keith and Rigby in *Lancet*, vol. 2, 1899, p. 1499 *et seq.*, have given very full and interesting details of many experiments made with Mauser, Lee-Metford, Dum-dum, etc., bullets. The results scarcely admit of very general deductions, except perhaps the following:—

1. That the wound of exit is commonly larger than that of entrance, but to this many exceptions must be made dependent on velocity, shape, and material of bullet, and apparently, too, upon some uncertain conditions.

2. That the gravity and extent of a bullet wound bear no proportion whatever to the external wounds either of entrance or exit. This is especially true when bones are struck.

3. That the head may be completely shattered by a bullet penetrating the cranium by a course fairly at right angles to the bone, and striking more or less centrally.

3. When was this Gunshot Inflicted?

A witness may be asked: When was the gunshot wound inflicted, and how long did the wounded person *survive* after receiving it? Like other wounds, a gunshot wound undergoes no change for eight or ten hours after its infliction. Our judgment in reference to these questions may be assisted by observing the parts which are involved, although we cannot always infer from the quantity of blood found near to a body that the bleeding was an immediate consequence of the wound, or that the whole of the blood was effused at once. We cannot, then, always affirm that the deceased could not have moved or exerted himself in some degree after receiving it. The exertion thus made subsequently to his being wounded may have actually caused the fatal bleeding.

If the wound be of something over ten or twelve hours in age, its age must be judged on general surgical principles by the amount of swelling, sloughing, suppuration, etc., for it becomes then merely a bruised wound (*vide ante*, pp. 416 and 436 *et seq.*).

4. Was the Victim Alive when Shot?

A medical witness may be asked whether the wound was inflicted *before or after death*. It is by no means easy to answer this question, unless the bullet has injured some vessel, when the effusion of blood and the formation of coagula will indicate that the person was living when it was received. If a gunshot wound has been produced in a dead body, no blood will be effused, unless the bullet strikes a large blood-vessel.

The question is, however, very little relevant, for if in ordinary wounds, when a murderer may be frenzied, or a suicide half-hearted, it seems futile to ask who but a murderer would injure a dead body, *à fortiori* there is still less reason to ask the question who would shoot a dead man.

If a gunshot be found on a dead body together with other wounds it might be of importance to know which wound caused death. This, like many other points, can only be judged by general principles, such as the nature of the wounds, the parts injured, the amount of hæmorrhage, etc. (*vide* "Causes of Death in Wounds," *ante*, also case on p. 572, blow on forehead and shot).

5. Is this Gunshot Dangerous to Life?

Again, a very definite and decided difference is found between wounds from high velocity weapons and those from ones of low velocity.

In the South African war there were hundreds, one might say thousands, of cases in which bullet wounds of soft tissues, and even of the bones, were followed by practically no symptoms whatever, and the soldiers were frequently able to return to the fight in a very short time after bullets had traversed regions usually considered dangerous. The most extraordinary case of this kind was one communicated to the editor by Mr. A. A. Bowlby, as follows:—

> A soldier was standing on a rock, when suddenly, according to his comrades' tale, his foot slipped, and he fell some few feet on to his shoulder. He was picked up, labelled "Contused Shoulder," and as such was treated. He could not return to duty on account of considerable paralysis, appearing as the result, so it was thought, of the contusion, for some weeks. On careful examination at a base hospital it was found that this man had had a bullet pass in at his mouth through the palate, thence through the base of the skull, through the brain at its base, and out by the occipital bone.

There were in the same war numerous instances of perforations of the lung, liver, kidneys, bowels, stomach, intestines, etc., wounds usually considered very dangerous, if not even necessarily fatal, but in which rapid recovery ensued provided that no treatment was adopted, and the victim took no food nor drink. For a full description and discussion on the treatment *vide* articles by Sir William McCormac, *Lancet*, vol. 1, 1900; also many other articles in *B. M. J.* and *Lancet* for the years 1900 and 1901, just subsequent to the Boer war; also a paper by Sir F. Treves, "Med.-Chir. Trans.," 1900.

On the other hand, Mr. Keith's experiments (*vide ante*) show that very extensive damage may be done internally without there being much external evidence of it.

With ordinary gunshot wounds in civil life the matter is, however, very different. These wounds are contused wounds, and contused in such a way that the bruised tissues are killed and consequently slough, with all the attendant dangers of hæmorrhage, extravasation of the contents of a hollow viscus, septicæmia, etc. They are, therefore, dangerous to life, first from shock, of which examples occur from time to time.

In the case of Daly, who was killed by a pistol bullet, it was found on inspection that the bullet had traversed the distended stomach at the greater end from behind forwards. The two apertures were about the size of a shilling, and the edges black. There was but little blood effused, and the other viscera were uninjured. The deceased died in a few seconds after receiving the wound, apparently from shock (*Lancet*, May, 1842).

Secondly, as in any other wound, from laceration of a large blood-vessel or important viscus, such as heart, brain, liver, etc., and thirdly from the almost inevitable sloughing, etc., above noted. Modern treatment has, however, very materially diminished the danger from this latter source, though there is still great difference of opinion amongst surgeons as to the exact details of the best treatment for perforating bullet wounds (*vide* works on surgery), into the details of which it is impossible to enter here.

A case is reported in the *Lancet*, 1, 1904, p. 1236, in which a patient with a bullet wound of the abdomen suddenly died after seven days' illness. At the necropsy a retro-peritoneal lesion of the abdominal aorta was found, with enormous hæmorrhage.

So long as the missile still remains in the body (an X-ray photograph will easily demonstrate this point) danger must be considered to still exist. Hence indirectly in such a case danger must be taken to be in some degree proportionate to the inaccessibility of the missile, coupled with its proximity to an important organ which could be damaged either by inflammation or by the shifting of the missile.

Instances of gunshot wounds proving fatal after a year and a day are not unfrequent, and they show the inconsistency of limiting the legal responsibility of an assailant by the period at which death takes place.

As in other wounds, but perhaps even with greater probability, the victim is exposed to the risk of infection by septic or pyæmic or special microbes (tetanus, erysipelas, etc.). The risk is greater because gunshot wounds are of the nature of punctured and bruised wounds, which cannot so effectually be cleansed as simple incised ones. Speaking in broad general terms, then, it must be admitted that a wound from a firearm is usually more dangerous than from a knife, etc.

The following case shows, amongst numerous other ones, this point very well :—

At Liverpool Spring Assizes, May, 1904, before Mr. Justice Bucknill, W. Kirwan was charged with the murder of Mary Pike by shooting. The medical evidence showed that the bullet had entered the chest on the left side, which had traversed the chest to the right side and fractured one of the right ribs. Septicæmia followed, and the woman died. Guilty and sentenced to death.

There was no evidence of any important organ being wounded. Death occurred simply from the blood-poisoning.

6. At what Distance was the Firearm Discharged?

In a very large number of cases this becomes a very material question, and unfortunatately it is by no means an easy one to answer very

definitely. The physico-mathematical facts upon which the solution depends are—

(1.) That the muzzle velocity of the missile is its maximum velocity.

(2.) That just at the muzzle there is great air pressure.

(3.) That from the muzzle of the firearm there is a spirt of air at a great heat.

(4.) That with the missile itself there issue other solid particles: wadding, grains of powder, etc.

The actual results of these factors vary very materially according to whether the arm be loaded with a bullet with large or small shot, whether it be a breech or muzzle-loading arm, and if the former they vary with the nature of the cartridge. Again, in shot guns the results vary according to whether it is a choke bore or not. Full experiments at all distances from an inch up to, say, a couple of yards, and with all varieties of powder and cartridges, chokes and non-chokes, are wanting, but there is practically sufficient evidence for purposes of forensic inquiry.

A tithe-collector was tried for the murder of a man by shooting him. It appeared in evidence that the prisoner while on duty was attacked by the deceased and two of his sons, and he drew a pistol to intimidate them. He was dragged off his horse by these persons, and during the scuffle, it is supposed, the pistol was discharged accidentally and inflicted a wound on the deceased, of which he died shortly afterwards. The sons of the deceased swore that the prisoner took a deliberate aim and fired the pistol at their father when at some distance, and a priest deposed that such was the dying declaration of the deceased. From some doubt of the truth of this story, the body, which had been carelessly inspected in the first instance, was disinterred. It was again examined by a surgeon, who was enabled to swear positively that the pistol must have been fired close to the body of the deceased, and not at a distance, since there were the marks of powder and burning on the wrist. Hence it followed that the pistol had not been discharged at a distance, but during the scuffle, either by accident or in self-defence. The prisoner was acquitted, and the parties who had appeared as witnesses against him were convicted of perjury.

Both the dress and skin of a person who has received a gun or pistol-shot wound should be closely examined. The result may be that the statement given of the mode in which a wound was received will be entirely disproved.

(1) and (2). **Muzzle Velocity and Air Pressure.**—If the arm be loaded with a conical bullet the effect of this is that the nearer it was discharged to the body the more likely is it that the bullet will traverse the body and make an even number of wounds, *i.e.*, will actually perforate the whole thickness of limbs or trunk and make apertures of exit as numerous as those of entrance, though here the charge of powder or driving force has more to do with the result than anything. Pistol bullets, for instance, rarely traverse the body completely so as to have a wound of exit, and especially is this true if to do so they have to traverse bone.

Of this the case of Miss Holland, already quoted under "Decomposition," affords a good illustration, for Professor Pepper found an almost complete pistol bullet in the cavity of the skull. The girl Poppie, brought into the London Hospital early in 1904, is another illustration. In her case there were two wounds in the left temporal region, known to have been caused by a pistol, and that, too, fired at such close range that one of them had powder particles scattered round it. Both bullets were

found, the one in the orbit having perforated the temporal bone and the thin outer wall of the orbit, the other lodged in the spongy bone by the sella turcica. This had also perforated the squamous portion of the temporal bone.

In the case of Mr. Drummond, who was shot by M'Naughton, the pistol was discharged close to the back of the deceased. The ball, however, had not traversed the body, but had lodged beneath the skin in the fore part of the abdomen. In the case of Latham, shot by Buranelli, although the pistol was discharged close to the deceased, the bullet lodged in the second vertebra of the neck, where it was found after death. It is then out of the power of a witness to say from the mere fact of a bullet lodging or traversing whether the assassin was far off or near at the time the deceased was wounded.

The same air pressure in some cases causes the wound of entrance to be enlarged, so that when in an act of suicide a pistol is discharged close to the chest the amount of injury done cannot be measured by the size of the bullet.

In a case of suicide in which a man discharged a pistol pressed closely to his chest, loaded with a bullet three-eighths of an inch in diameter, the whole of the clothes were torn through, and portions of them, with parts of the ribs, were carried deeply into the chest. The opening in the chest was circular, and three inches in diameter. The margin was burnt and ragged. The heart was intact, but the left lung was completely shattered. The small bullet was found firmly impacted in the fourth dorsal vertebra, on the left side.

The explosion of the gunpowder close to the body sufficiently accounted for this large wound, together with the fact that tough clothes interposed between the skin and the muzzle. In the case of Poppie (*supra*), the size of the skin wound was approximately that of the bullet.

A single bullet of no great dimensions fired from a gun at a distance of from four to six yards from the person has been known to produce an extensive wound. In the case of Mr. Walshe, who was shot by a man named Wells in 1868, the bullet had traversed the head, entirely destroying the nose. The entrance aperture at this point was so large as to admit three or four fingers. The bullet had passed out behind, splitting the occipital bone, and it was found in the room with a stain of blood upon it, and some hair resembling that of the deceased. In this case the bullet, of the Minié pattern, weighed only 250 grains, but it produced a very large wound, being driven by a very powerful force of powder.

An examination of the *dress* alone will sometimes enable us to give an opinion as to where the bullet had passed in, and to form a judgment of the distance at which the shot was fired. If a ball strikes at a moderate distance, the aperture in the dress where it enters is round, and the margin is regularly defined, but the aperture by which it passes out is irregularly torn.

In one case the ball traversed the left arm. It had taken out a circular piece of the coat, shirt, and undershirt where it had entered, but it produced a large irregular opening where it had passed out.

Sometimes portions of the dress are carried into the wound, or, if the ball is nearly spent, the dress is elongated like a pouch into the wound. By putting the edges of the cloth together where the bullet has passed in it may be seen whether any of the cloth has been carried before it. The holes are generally ragged, but the nearer the wounded person is to the assailant the more perfect is the hole in the

dress, provided the piece be not discharged in immediate contact. The bruised and dark appearance which a gunshot wound sometimes presents, even when the piece is discharged at a distance from the body, has led to the supposition that this effect was due to a burn, and that the bullet burnt the parts which it touched, but this idea is exploded. The projectile never becomes sufficiently heated to acquire the least power of burning.

In the case of firearms loaded with shot, it has been found that a round aperture may be produced by the discharge of small-shot at a much greater distance from the object than that assigned by Lachèse. A new gun was fired with the usual charge at a sheet of paper placed at sixty paces distance. A circular hole was produced in the centre of the sheet, through which apparently every shot had passed [probably a wire cartridge or a fully choked barrel, if the distances are correct.—Ed.]. The hole was slightly jagged at the edge, but otherwise resembled that made by a bullet. New guns, and those discharging cartridges, throw the shot very closely together [if choked or otherwise prepared.—Ed.], and this is the explanation of the difference in the results thus obtained and those described by Lachèse. Admitting such exceptional instances, and assuming the general correctness of the inferences drawn by Lachèse from the results of his experiments in discharging small-shot at dead bodies placed at different distances, it does not seem probable that a wound from small-shot could, under any circumstances, be mistaken for one produced by a leaden *bullet*. This question arose in a case tried by Parke, B. (*Reg.* v. *Spriggs*, Lewes Lent Ass., 1854), in which the prisoner was charged, upon his own statement, with having caused the death of his wife by discharging at her a loaded gun.

When seen shortly after by the medical witness, the deceased was quite dead. There was a "jagged" wound upon her forehead, about an inch above the right eyebrow. The witness described it as a wound which, from its appearance, might have been produced by any blunt instrument, or by a gun fired from a short distance. On further examination it was found that the back part of the head had been driven in, and it appeared as though the shot had passed completely through the head and brain, passing out behind in a direction slanting downwards, the wound behind being three inches lower than that in front. He did not see any shot, nor did he open the head to endeavour to find any; but a portion of the skull and hair had been driven into the wound. The judge properly suggested that the brain should have been examined, as some shot might have remained there, and this would have shown exactly how the mortal injury had been produced. The witness was strongly pressed to say whether he was certain the injury had been caused by shot, and not by a bullet. He said he was certain it was by shot, as he had had much experience of bullet wounds. Fortunately there was good evidence to show that one barrel only of the prisoner's gun had been discharged, and the undischarged barrel was found loaded with shot. The prisoner was convicted. There appears to have been no mark of burning or singeing of the hair or dress in this case, or the witness would not have suggested that the wound might have been occasioned by a blunt instrument. Considering that there were two penetrating wounds on opposite sides of the head, this was a singular part of the evidence. It was clear that there was one great central wound (the entrance wound), which, although described as "jagged," appeared difficult to be accounted for, as no shot were scattered, or could be found in the skin. Yet this single wound was obviously caused by small-shot.

In all similar cases, it would be proper to examine the track of a wound throughout. According to Lachèse's experiments, it is probable that the piece was in this case discharged within twelve to eighteen

inches from the surface of the skin. The editor leaves this case as it stands in former editions, because it affords such an excellent illustration of how not to do a medico-legal autopsy.

A discharge of small-shot, in contact with the skin or close to it, generally produces, not a round opening, but a severe lacerated wound.

A man lay down on the grass and fell asleep, the muzzle of his gun being close to the back of the calf of his left leg, and pointing in a slanting direction downwards. By some accident the gun went off, and the shot produced a laceration of the whole of the fleshy part of the leg, with no appearance of a round perforation. As might be expected from the closeness of the discharge, the leg of his trousers was much burnt as well as cut and torn.

Although, according to Lachèse's experiments, a round opening may be produced by small-shot when the piece is fired at a distance of a foot from the body, the above case proves that the shot may be scattered, and an extensively lacerated wound caused, when the muzzle is close to the skin, and the piece is discharged point-blank. The scattering of the shot, however, in such a case, could not lead to the inference that the discharge had taken place from a distance, because the skin and dress would always present distinct marks of burning. When a piece is fired near, the shot may be carried into the wound without scattering, and it may be found lying like a solid mass in the wound. This was proved to have been the case in *Reg.* v. *Evans* (Swansea Lent Ass., 1869). In 1869, a gentleman was accidentally shot by the discharge of his gun from behind. The entire shot was found lodged, as in a purse, in the muscles behind the thigh-bone. It is difficult to conceive that small-shot could produce a single entrance wound, having an appearance of circularity about it, without at the same time singeing or burning the skin or dress.

(3). **Burning of the Wound.**—The case of Peytel furnishes a good illustration of the importance of observing the fact of burning. This man was travelling in a carriage, in company with his wife, and attended by a manservant. The wife and the manservant were found dead on the road, and the account given by Peytel was, that the servant had discharged a pistol into the carriage and shot his wife, and he had afterwards pursued and killed him. The facts, however, were so suspicious against Peytel, that he was charged with the double murder. From an examination of the body of the wife, it appeared that there were two pistol-wounds in the face, which had most probably been produced by two separate pistols. The prisoner alleged that about nine o'clock at night, when it was dark, he desired the servant to get down and walk in order to relieve the horses. Two minutes afterwards, some man, whom he found to be the servant, approached the carriage door, discharged a pistol at him, and wounded his wife; but the evidence showed that two weapons must have been used, or at least two different discharges made by a person sitting very near to the deceased, so that the muzzles must have almost touched her face—the eyelashes and skin having been much burnt by the powder. These facts, together with other strong circumstances against him, led to the prisoner's conviction. Ollivier considered that the deceased might have been shot by the servant, and that the two wounds might have been produced by one pistol loaded with two bullets; also, that the marks of burning about the face of the deceased might be attributed to the wadding, and, therefore, they

afforded no proof that the muzzle of the pistol had, at the time of its discharge, been close to her person. He further contended that the deceased had not died from the wounds. Notwithstanding these suggestions the prisoner was convicted ("Ann. d'Hyg.," 1839, 2, 339; 1842, 1, 368). The amount or degree to which the clothes and body of a person may be burnt by the near discharge of firearms has given rise to a medico-legal inquiry. A fact of this kind can only be determined by the circumstances of each case ("Ann. d'Hyg.," 1860, 1, 125).

As regards the actual distance at which burning of the wound or clothes may occur, the editor, from a few slight experiments he has made, holds a very strong view that it is impossible to lay down any rules; with an ordinary cartridge loaded with shot, he could never succeed in causing actual fire (smouldering or flame) neither in paper nor cloth, but he has succeeded at distances not exceeding six inches, when the shot was omitted. The facts in any given case can only be determined by experiments with the actual weapon used, and loaded as nearly as possible in the same manner as it was when used for the purposes which are being investigated.

(4). **Wounds and Marks from Wadding and Powder, etc.**—A gun loaded with wadding, or even with gunpowder only, may cause death. In these cases an impulsive force is given by the explosion, and the substance becomes a dangerous projectile. The lighter the projectile, the shorter the distance to which it is carried; but when discharged near to the body, it may produce a fatal penetrating wound. A portion of the dress may be carried into the wound, and lead to death from bleeding; or if the wounded person recover from the first effects, he may subsequently sink under an attack of tetanus or erysipelas. Fatal accidents frequently occur from persons discharging guns or pistols at others in sport—an act which they think they may perform without danger, because the pieces are not loaded with ball or shot.

In *Reg.* v. *Race* (Bury Lent Ass., March, 1840), it was proved that the prisoner had killed the deceased by discharging at him, within a few feet, a gun loaded with powder and paper wadding. The deceased fell and died in a few minutes. It was found that the chest was penetrated, and that the wadding had wounded the left auricle of the heart ("Ann. d'Hyg.," 1859, 1, 421). In 1838 a girl was killed by a boy, who discharged at her a gun loaded with paper pellets. Some of these penetrated the body and lodged in the lungs and liver. Dupuytren mentions an instance, where, during a quarrel between two men, one discharged at the other a gun loaded with powder and wadding only at a distance of about eighteen inches. The man instantly fell dead. On inspection his clothes were found torn, the intestines were lacerated, blood was effused, and the wadding was lodged in the abdomen.

In 1881, a man sitting in the gallery of a theatre at Brighton, had the upper half of the hand completely blown away by a piece of greased newspaper, tightly rammed, discharged from a small cannon on the stage of the theatre.

It has been observed that persons in attempting to commit suicide have occasionally forgotten to put a bullet into the pistol. [Not likely to happen now, when cartridges are so universally used.—Ed.] Nevertheless, the discharge of a piece into the mouth has sufficed, from the effect of the wadding only, to produce considerable destruction of parts, and to cause serious loss of blood. Fatal accidents have frequently taken place from the discharge of wadding from cannon

during reviews. It is not easy to say at what distance a weapon charged with wadding and gunpowder would cease to produce mischief, since this must depend on the impulsive force given by the charge of powder, and on the size of the piece. Lachèse found that a piece charged with gunpowder only is capable of producing a penetrating wound somewhat resembling that caused by small-shot, when the piece is large, strongly charged, and fired within six inches of the surface of the body ("Ann. d'Hyg.," 1836, p. 368). This arises from a portion of the powder always escaping combustion at the time of discharge, and each grain then acts like a pellet of small-shot. Under any circumstances, a discharge of powder contuses the skin, producing ecchymosis, and often lacerating it, if the piece is fired near. The dress is burnt, and the skin scorched from the flame formed by the combustion of the powder; many particles of gunpowder may be actually driven into the true skin. All the substances here spoken of are considered to be projectiles; and the weapons are held in law to be loaded arms, so long as they are capable of producing bodily injury at the distance from which the piece containing them is discharged. It may therefore become a question as to the distance at which these light projectiles cease to be harmless. The answer must be governed by circumstances; but it will in all cases materially depend on the strength of the charge. In *Reg.* v. *Collier* (Abingdon Lent Ass., 1844) the prisoner was charged with firing a gun loaded with small-shot at the prosecutor, with intent to do grievous bodily harm. It appeared that the gun was deliberately pointed at the prosecutor, who was then at a distance of from seventy to eighty yards from the prisoner. The shot, which was very small, had marked the clothes, but had not penetrated the skin or inflicted any wound. The defence was, that, from the slight injury done, the prisoner merely intended to frighten the prosecutor, and not to do him any bodily harm. He was found guilty of common assault. The question was here a delicate one, for had the prosecutor been a few yards nearer, and the pellets touched an exposed part of his body, the result might have been serious. One pellet has destroyed life. A case occurred in the United States, involving the question as to the distance at which a pistol *not* loaded with ball would suffice to produce a serious wound. A boy in play discharged a pistol at a companion, producing on the fleshy part of the left hip a wound one inch in diameter and four inches in depth. The skin was destroyed, and the muscles were a blackened lacerated mass. There was no ball in the pistol; but it is not certain whether there was wadding. Death took place from tetanus on the seventh day, and on examination no wadding was found in the wound. There were, however, grains of gunpowder, with which the wound was blackened throughout its whole extent. At the inquest the witnesses differed respecting the distance at which the pistol was held when the wound was inflicted. Some said one foot, others two or three yards. The deceased had stated his belief that the pistol had almost touched him, and, judging by the state of the wounded parts, this was probably the truth. Swift contended that the wound had been produced by gunpowder only, without wadding. He performed some experiments with the pistol used by the prisoner, but loaded with gunpowder and *wadding*, in order to determine the effect of the discharges at different

distances. At twelve inches distance from a body, he found that the clothes were lacerated and the skin abraded, but the wadding did not penetrate; at six inches the clothes were lacerated, and the wadding penetrated to the depth of half an inch; at two inches the wound produced, which was two inches deep, was ragged and blackened; at one and a-half inch from the chest the wadding passed into the cavity between the ribs, and in a second experiment it carried away a portion of a rib (*Med. Gaz.*, vol. 40, p. 734). This subject was investigated by Mackintosh, and he found, in reference to the wounds produced by wadding, that the amount of injury done is in proportion to the amount of powder in the gun, the hardness and compactness of the wadding or substance used in place of shot or bullet, and the distance of the object from the point of firing. A case occurred in his practice which was the subject of a trial for unlawful wounding: *Reg.* v. *Isgute* (Norwich Lent Ass., 1867). The prisoner fired at a boy with a gun loaded with brown paper, pressed together. He was then at a distance of two or three yards from the boy. There was a wound in the chest about the size of a shilling. The margin of the wound was jagged, had a bluish-black or mottled appearance, and the edges of one of the ribs was laid bare. The paper pellet took a course downwards, as a result of a deflection of the projectile by the rib. A quantity of brown paper was removed from the wound, and the boy ultimately recovered. The question which Mackintosh proposed to consider was whether paper wadding could really produce such a wound as was here found, when the gun was fired from a distance of *two or three yards*. Without going into details, it may be stated, that when the gun was charged with a small quantity of powder and brown-paper wadding there was indentation, but no penetration at a distance of two yards. With one-third more powder and a brown-paper pellet closely compressed, there was penetration through the boy's jacket to an inch and a-half beyond. These facts bear out the conclusion already given, and confirmed the boy's account of the distance from which the gun was fired at him by the prisoner. Swift had inferred from his experiments that a penetrating wound from wadding was not produced unless the piece was discharged within a distance of six inches; but Mackintosh's results clearly show that this must depend on the quantity of powder used, and the loose or compact nature of the substance employed as a projectile.

The following is taken from the *B. M. J. Epitome*, 1, 1904, p. 98: —"Johnson ("Ann. Surg.," No. 5, 1904) publishes the results of some experiments he has recently made with the object of determining the effects on the skin and the clothing of the discharge of pistols loaded with smokeless powder. The following conclusions are drawn from these experiments, which, however, are acknowledged by the author to be few in number and by no means complete:—1. The marks upon the skin and clothing produced by smokeless powder are much less distinct and definite than those caused by black powder. 2. With the weapons used in these experiments (Colt's automatic pistol, calibre 32 and 38; the Luger automatic pistol, calibre 7·65 mm.; the Mauser repeating pistol, calibre 7·63 mm.) such marks are no longer produced when the distance exceeds one foot and the shot is fired at the naked skin. 3. At a distance of three inches or less powder marks may be

present, but they will always be faint, and may in many instances be wiped away from the skin with a wet or dry cloth. 4. If the pistol be discharged at a part of the body covered by clothing no powder marks at all will be found on the skin. The clothing will never be scorched no matter how near the weapon is held. If the clothing be of wool no powder mark is likely to be detected upon it even at the closest range, unless under the microscope. If the clothing be of linen a faint mark may be found on it if the weapon were discharged at a distance of three or four inches or less. If the distance much exceeded this no mark would be produced."

The matter may be summed up thus:—If there are marks of powder or burning the weapon was not more than a foot away when fired; if there are no marks it is impossible to tell how far off it was, for one negative upsets any number of positives in this instance.

This statement fully answers the following question, which was addressed to Dr. Stevenson in 1898:—

"In the case in which I am giving evidence the condition of the injured part is thus described in my post-mortem book:—'Midway between the tragus of the left ear and the external angle of the left eye there is ecchymosis of about the size of a penny piece, and in the centre of this a circular punctured wound with inverted and jagged edges measuring a quarter of an inch in diameter (the bullet is three-eighths of an inch in diameter); there is no evidence of burning or discoloration by gunpowder.'

"The point I am anxious to settle in my own mind is, What was the probable distance of the assailant when he fired the revolver at the deceased?

"The cartridges are made by Messrs. Eley; contain fourteen grains of black powder, and the bullet weighs 124 grains.

"If you can give me a hint on these points I shall be grateful."

7. How was it Inflicted?

This question is as a rule somewhat easier to answer in the case of gunshot wounds than in ordinary wounds; it means, of course, Did the deceased receive the wound while standing or lying down; while running away or approaching; in what direction was the weapon pointed when fired; was it fired from the shoulder? The points we have for the solution of the problem are:—

1. The evidence of eye-witnesses.
2. The wound of entrance contrasted with that of exit.
3. The direction of the wound which joins the wound of entrance either with the missile or the wound of exit.
4. Evidence derivable from a multiplicity of wounds.

1. The Evidence of Eye-Witnesses.—This is, of course, extremely variable in quality both as regards absolute reliability and clearness, even where there is no object in concealing the truth, but inasmuch as the report of a firearm can always be heard, even in the midst of the loudest quarrel, it is more probable that the attention of those near would be immediately attracted than in the case of the use of a knife or other silent weapon. Not only would the attention be thus drawn to the firing of the piece, but the details of the occurrence would also be more likely to be thereby fixed on the memory, whether, for instance, the shooter was standing, lying or kneeling; whether the victim was in a similar or different position; in fact, if there are witnesses of the

occurrence their evidence is generally very direct. In the following case, for instance, no difficulty arose on this score :—

At the Liverpool Spring Assizes, 1904, before Mr. Justice Bucknill, Pong Lun, a Chinaman, was charged with having murdered Go Hing. A quarrel arose about money, and the prisoner left the room and returned, and directly afterwards he fired two shots at the deceased and two more outside the room. The revolver, a five-chambered one, was picked up, and four spent and one live cartridges were found in it. In the prisoner's possession were cartridges that fitted it and corresponded with the ones in the pistol. The dying depositions of the deceased contradicted, in the number of shots fired, the evidence of other witnesses, but corroborated the statement that the prisoner fired the fatal shot. The bullet that caused death had passed through the abdomen, injuring the intestine, kidney, and pancreas. These injuries had caused peritonitis and also severe loss of blood. The prisoner was found guilty, sentenced to death, and hanged. His counsel pleaded for a verdict of manslaughter, but the judge overruled this on the grounds :—1. That the prisoner had deliberately gone out of the room to fetch the lethal weapon. 2. That he was not so drunk but that his mind understood the nature of his act.

2. **Wound of Entrance contrasted with the Wound of Exit.**—For the actual differences *vide ante*, p. 550. It is, of course, obvious that the position of wound of entrance marks the part of the body which was at the moment of discharge nearest to the muzzle of the weapon, or rather in a straight line with the muzzle ; it therefore indicates with mathematical precision whether the victim was facing the muzzle or with his back or side to it.

3. **The Direction of the Internal Wound.**—Speaking in broad, general terms, the missile fired from a firearm has a tendency to continue in a straight line from the point of entrance to its point of lodgment, or to the wound of exit, so that if the internal wound be straight, this straight line proves accurately the direction in which the barrel of the weapon was pointed when fired. But it must be particularly noted that very frequently this wound is not straight, but curved, the missile being deflected from its true original rectilinear course (in civil, as opposed to military, life, there is no need to take into account plunging fire, and the true parabolic curve of projectiles) by slight obstacles, such as bones, etc.

From the above rule it follows that if a person be shot in a standing position and a wound be found nearly transverse through the chest, the firearm was certainly fired from about the level of the shoulder, a position which may have important bearings as to intent, accident, or homicide. Again, as in the two following cases, where shots were fired with malicious intent without killing anybody ; if we can at any time discover two fixed points where a ball has touched a *building* without being deflected, it will be easy to determine the *direction* from which the piece was discharged.

An illustration of this is given by Watson. The case occurred at Ayr, in 1831. Several shots had been maliciously fired into a church. Some of the bullets traversed a window, making holes in the glass, and struck against a wall on the other side of the church—a fact plainly indicated by the marks which they left. A straight line carried from these two points reached a window on the opposite side of the street, from which it was afterwards ascertained the bullets had been fired. In a case tried at the Kingston Lent Assizes, 1862, a similar piece of evidence clearly showed that a gun loaded with a bullet had been maliciously discharged with a design to kill one of two persons. The prosecutrix and her mother were sitting by candlelight one evening near a window in their house, so that their shadows were projected on the blind : a bullet passed through the window and struck the wall of

the house inside. A line drawn between these points was about half an inch over the head of the prosecutrix, and about one inch below the level of her mother's head. Neither was hurt. The prisoner was connected with the act by his having been seen near the spot, and by a variety of circumstances. It was alleged in defence that the prisoner had gone out with his gun in the evening to shoot birds with bullets, and that the piece had been discharged by some accident. The judge directed the jury to consider with what intent a shot could have been fired so as to come within half an inch of the head of a person. The prisoner was convicted.

In judging of the *direction* taken by wounds which traverse the chest from front to back, it is necessary to remember the great difference that exists in the level of the same rib anteriorly and posteriorly. This must be especially attended to when we are called upon to state the direction of a traversing wound from the description of it given by another. The point here referred to had an important bearing in the case of a fatal gunshot wound, which was the subject of a criminal charge (Henke's *Zeitschrift*, 1836). A reference to an articulated skeleton will show that a straight line, touching the upper edge of the sixth rib behind, would be on a level with the upper edge of the third rib in front.

A person died from a single pellet of small-shot traversing the chest from before backwards. The pellet entered between the first and second rib anteriorly, and traversing the lung, caused death by lacerating the sixth intercostal artery, near its origin at the lower edge of the sixth rib, posteriorly. In giving an opinion on the direction of this wound, one medical witness described the wound behind as being six inches below the level of that in front. As the small canal through the lungs could not be discovered, he was inclined to think that the two wounds could not be connected, because the gun had been discharged from the shoulder when the party firing was nearly on a level with the deceased. This opinion, however, was soon corrected by a reference to the anatomical relations of the parietes of the thorax. Indeed, it will be found that a straight line carried backwards from between the first and second ribs in front will, in a well-formed skeleton, touch the upper border of the fifth rib posteriorly; therefore this wound was nearly *horizontal* —being only one inch and a-quarter lower posteriorly than anteriorly. In the case of Colonel Fawcett, killed in a duel, the bullet entered on the right side of the chest, fracturing the *seventh* rib, and after traversing the posterior part of the lungs lodged in the *ninth* dorsal vertebra. These parts are in a line with each other, and the wound was horizontal.

It must not be forgotten that a wound immediately below the sternum, will in its fore part involve the viscera of the abdomen—in the back part those of the chest, and in its central part it will traverse the diaphragm.

When a ball traverses the body it sometimes happens that the two apertures are opposite to each other, although the ball may not have taken a rectilinear course between them, but have been variously deflected by the subjacent soft parts. This deflection of a ball from a rectilinear course is met with in those cases in which it strikes obliquely a curved surface, and it is found that when the ball enters and does not pass out, its course is often circuitous, so that it is not always easy to say in what part of the body it will be found.

Once the author saw a boy who had received a gunshot wound in the upper part of the abdomen; the entrance orifice was plainly situated there, but there was an opening at the back, nearly diametrically opposite, out of which the ball had passed, so that it conveyed the impression that the ball had completely traversed the abdominal cavity. There was, however, no sign of collapse or depression, nor any indication of serious injury; and Dupuytren gave an opinion, which was afterwards verified, that the ball had not penetrated, but had been

deflected boneath the skin, and had taken a circnitous course through the cellular tissue to the back. Many similar facts are recorded. The same deflection may occur even when the piece is discharged close to the body, as in cases of suicide. Abernethy was called to examine a man, who had shot himself, as it was supposed, through the head. He found two openings in the scalp, nearly opposite to each other. It was soon perceived that the ball had not penetrated the bone, but had followed the curve of the exterior of the skull to its point of exit.

The deflection of projectiles may occur not merely when they come in contact with bone, but when they meet skin, muscles, tendons, or membranes; the ball then takes its course in the spaces between these different structures. A ball which entered at the ankle has been known to make its exit at the knee; and another, which entered at the back of the left shoulder, passed down on the inside of the scapula, and was found below the right ear. Many other cases will be found in the *Medical Journals* for 1900, 1901, and 1902. This deflection of a ball by slight obstacles has been ascribed, partly to the obliquity with which it strikes, and partly to the rotary motion on its axis, which every spherical projectile is considered to have. The same deviation has been found to occur when the bullet was fired near or at a distance, provided that it was fired from an old-fashioned firearm, or was a rounded missile. The modern small-bore rifle bullet has a much greater tendency to preserve its course, though the above references show that even here deflection may occur.

4. **Evidence from Several Wounds.**—When several wounds are found on a body, can we determine whether they were produced by one or several different discharges, or how they were produced? This question was raised in a case in which there were two wounds on the deceased, and the prisoner alleged that but one pistol had been discharged. One ball may sometimes produce several wounds on the body; and then there will be only one orifice of entrance, but, owing to the ball occasionally splitting within the body, and dividing itself into three or four pieces, there may be several orifices of exit. This splitting of a ball has repeatedly occurred when the projectile in its course has encountered an angular surface, or a projecting ridge of bone.

Dupuytren met with an instance, in which a ball, after having struck the ridge of the bone of the leg (tibia), divided into two parts, which traversed the calf of one leg, and penetrated into the calf of the opposite leg. Thus no fewer than five wounds were produced in one instance by a single ball—three of entrance and two of exit. A similar effect was observed in a case in which the bullet struck the parietal bone of the head and divided into two portions:—One passed out superficially through the skin, the other penetrated into the brain, and lodged on the tentorium.

This fact shows that the discovery of an exit aperture does not always prove that the whole of a projectile has passed out—a matter which may influence a medical opinion as to the result.

Several wounds are commonly produced also by small-shot, but it must not be forgotten that small-shot may, when fired at very close range, produce only one entrance wound. Lachèse found, by many experiments on dead bodies, that in order to produce with small-shot a round opening, somewhat resembling that produced by a bullet, the discharge should take place point-blank at the distance of not more than ten or twelve inches from the surface of the body. When the

distance was from twelve to eighteen inches, the opening made was irregular, and the borders were much lacerated; at thirty-six inches, a central opening was entirely lost, and the surface of the body was covered by the scattered shot. The effect after this was found to depend on the distance, the goodness of the gun, and the strength of the charge ("Ann. d'Hyg.," 1836); but the shot is, in general, much scattered over the surface of the body. For further details and discussion, *vide ante*, "At what Distance was the Weapon discharged?"

In 1893, the editor met with the following case, in which the presence of several wounds on the elbow showed conclusively how the shot was fired :—

Two children, a boy and a girl, were by themselves in a workshop where a loaded gun was kept; the boy was five, the girl a little older; the gun was heard to go off, and the little girl came running out of the shop. The gun was found on the floor some six feet or more away from the boy, who lay dead on the floor; the muzzle was towards him and the butt away from him. No reliance at all could be placed on the girl's story, from fright and fear of the consequences of what she might say. Suicide and deliberate homicide were out of the question, and it was left to the medical evidence to clear up how the girl had accidentally shot her brother. Autopsy revealed some half-dozen small wounds made by the shot above the right elbow, entering just below the right elbow and running obliquely through the muscles up towards the upper arm; also a very large jagged wound in the neck just below the jaw, shattering the second and third cervical vertebræ, in which were lodged a large number of shot. Collectively, these wounds showed conclusively that the girl must have pointed the gun at her little brother; that he in alarm put up his right arm in a bent position to shield himself; the girl had then pulled the trigger, probably quite unintentionally, and the elbow being a little out of the direct line of the bulk of the charge had received only a few pellets, the greater portion going under the arm and catching the neck. The girl had probably only about sufficient strength to hold the gun not quite to the shoulder, but being taller than the boy the shot had taken a practically horizontal direction in him. Entire absence of marks of powder, coupled with the balling of the shot, showed that the shot was probably fired about two feet or a little more from the boy's head. Measurements of the scene of the occurrence corroborated pretty closely this view.

In the following case the editor feels that the medical witness might have spoken more strongly (*R.* v. *Dowell*, C. C. C., February, 1903).

The medical evidence was to the effect that the prosecutor had two wounds in front of his chest, one just above the seventh rib, and one in the middle line—both wounds tracked under the skin, the upper one for about two inches, and the lower one for about four inches—the bullets were just under the skin, and were removed the same day—the wounds are now practically healed—they were both in dangerous positions—I do not think they struck with great force.

Both bullets went in an upward direction, after entering the body, and are *consistent with* the view that the person who held the revolver was on the ground.

8. Was it Accident, Suicide, or Homicide?

The reader is referred to pp. 454 *et seq.*, where the same question is discussed in reference to wounds of an ordinary character. In gunshot wounds the evidence is derived from the same sources, but it is in some respects more definite in its indications, one reason being that the nature of the weapon is fairly obvious.

The following case from previous editions of this work is well worth insertion as a special demonstration of the difficulties in deciding the

point, and how they may be rendered insuperable by the stupid actions of ignorant persons.

The case was the trial of a Dr. Smith for the murder of a William Macdonald (High Court of Just., Edin., April, 1854). It appeared that the deceased was found dead in a field belonging to the prisoner, on the morning of November 20th. The body, according to the testimony of eye-witnesses, was lying at full length on its left side in a ditch. The left arm was partly beneath, and the right partly across the body. There was a blackened wound or hole in, and a little blood on, the cheek. A pistol was lying on the ground, according to one witness, about four feet from the head of the deceased. The time at which the deceased died was fixed with tolerable precision at twenty-five minutes before eight o'clock on the evening of November 19th; and although the prisoner was not seen near the spot, there was evidence that he had made an appointment to meet the deceased that evening, and the testimony of many witnesses showed that he had had an opportunity of being on the spot at the time when the discharge of a pistol was heard. The defence was, that this was an act of suicide. The pistol could not be identified as belonging to the prisoner; and one witness for the defence positively swore that, six years before, he had sold to the deceased a pistol resembling that found near the body. Upon this statement, and upon the failure of the medical evidence to throw any light upon the important question of homicide or suicide, the prisoner was discharged on a verdict of Not Proven (*Med. Times and Gaz.*, 1854, 1, pp. 411 and 522).

It was proved by two medical witnesses that the deceased had died from a pistol-shot, the bullet having penetrated the brain. From the characters of the wound, one witness thought that the muzzle of the pistol when discharged must have been within from three to twelve inches of the face. He admitted that, as an act of suicide, the body might have assumed the position in which it was found, but that the probabilities were against it. The other witnesses thought that the pistol when discharged might have been twelve or thirteen inches from the face; and although a person standing could, in his opinion, have made the wound that appeared on the cheek, yet a suicide would probably have made more sure of his aim by selecting another position. The only information regarding the wound was, that it was in the right cheek, below the malar prominence; that the opening was blackened, and the nose scorched with gunpowder. It appears that the medical witnesses did not see the body until after the lapse of *two days*. It had in fact been removed from the spot, washed, dressed in grave-clothes, and put into a coffin, before they saw it (*Med. Times and Gaz.*, 1854, 1, p. 525). Thus the marks of gunpowder on one of the hands, generally found in suicide by pistols, were not seen here; and the removal of the body from the spot placed the medical men in a difficulty, since they could base their opinion only on the statement of ignorant witnesses. There were marks of blood on the ground; but these, it was suggested, might have been accidentally caused during the removal of the body. The situation of the wound—*i.e.*, below the malar prominence in the cheek—is rather unusual for an act of suicide, but it was such as a murderer walking by the side of the deceased could have easily selected. The distance at which the pistol was held appears to have been greater than we usually find in cases of suicide; for had it been close, as it usually is in suicide, there would have been marks of extensive burning and laceration of the soft parts about the wound. The position of the pistol with respect to the dead body, as described by the witnesses who found it, is inconsistent with the supposition that deceased had thus fallen accidentally after having himself discharged the pistol. There was no motive for suicide, and no reason why, had suicide been contemplated, the deceased should have selected the prisoner's field for perpetrating the act. The deceased had been seen transacting business within half an hour of the time at which he must have died; and it was stated by his friends that they had never seen him with a gun or pistol in his possession, and had never known him to use firearms. Every fact tended to prove that this was an act of homicide, and not of suicide; further, there was no mark of struggling or scuffling, and no robbery had been perpetrated. The accused had the motive, means, and opportunity of committing the crime, but there were no circumstances which could directly connect him with it. The early interference with the body, and the neglect to call for a medical investigation, probably led to the obliteration of parts of the evidence which would have clearly satisfied the jury that this could not have been an act of suicide.

Evidence may be obtained—

1. From situation;
2. From design;
3. From proximity of weapon on discharge;
4. From position of weapon when found after death;
5. From direction of wound;
6. From nature of projectile and of wadding, etc.

1. **Evidence from the Situation.**—Suicidal wounds from firearms are almost always directed to what is considered a vital part, heart or brain usually. It is not, however, to be at once assumed that such a situation negatives homicide, for a murderer would naturally try to strike the same points. Other factors, such as the nearness of the weapon, must be considered (*vide* below). There is, however, one situation which it is almost impossible for a murderer to imitate, and that is inside the mouth. It is true that a man might be so stupefied with drink or sleep, etc., or a child might be so frightened, as to allow a murderer to place the muzzle of the weapon within the mouth, but there would very likely be evidence of this. Wounds of the medulla or brain are especially liable to be followed by instantaneous cadaveric rigidity. Therefore if there were no laceration of lips or front teeth, thus proving that the muzzle had been in the mouth, and if the weapon were not firmly grasped in the dead person's hand, there would be the very strongest reason from situation alone to suspect homicide.

Again, unless elaborate preparations for suicide (strings, sticks, etc., attached to the trigger) have been made, it is very rare indeed, though not absolutely impossible, for a suicide to shoot himself from behind. Moreover, except the head, the laity would not know where at the back to inflict a fatal wound. Hence it is very important to ascertain the point of entrance of a missile (*vide* Miss Holland's case, *ante*, where this was possible). If the missile still remain in the body, this is, of course, easy; if it have also a wound of exit, there may be a little more difficulty (*vide* "Wound of Entrance compared with Wound of Exit").

In the following case of attempted suicide the characters of the wound somewhat resembled those which are commonly imputed to homicide:—

In 1844 a man was brought to Guy's Hospital with a large ragged gunshot wound on the right side of the head, behind the angle of the jaw, and between it and the ear. No slugs or bullet could be found; the direction was from behind forwards and from above downwards. According to this man's statement, the pistol missed fire three times, but he succeeded in discharging it into his mouth at the fourth attempt. He lost a large quantity of blood, but after some time he walked to a table at the distance of five yards, reloaded the pistol, and discharged it at the back of the head in the situation described. Thus, then, there were in this case two wounds, one of them being apparently homicidal in its characters; and there was a power of locomotion after the first wound in spite of great loss of blood.

A gunshot wound in the mouth or temple would seldom be set down to accident, and yet attempts are occasionally made to ascribe to such wounds an accidental origin. The admission, that a near wound in the temple had occurred from accident, must depend entirely upon the circumstances proved.

2. **Evidence from Design.**—In suicide there is commonly strong evidence of design; in accident all evidence of design is wanting.

Suicides sometimes make use of unusual weapons, or use weapons in an extraordinary manner. In a case that was brought into St. Thomas's Hospital a young man employed, for the purpose of shooting himself, the case of an Italian iron, in which he had filed a touch-hole. He used a marble for a bullet, and discharged the piece into his mouth. Guns are rarely used by suicides, and when they are employed the marks of design are commonly evident; thus the gun is perhaps found to have been discharged by a piece of string attached to the trigger and connected with the deceased's foot. In one instance a man loaded a gun and placed the stock and breech in a grate. He then deliberately lighted a fire in the grate and sat opposite to the muzzle.

The following case is interesting from the evidence of design in the murderer's suicide, and also from the distance which the victim was able to run after being shot in the head :—

In June, 1904, an inquest was held on H. Baker and Alb. Corner in Devonshire, the latter having shot the former and then committed suicide with the same gun. The murderer fired two shots at his victim. Dr. Harston said the first shot smashed the upper and lower jaws, and how the farmer managed to run forty yards, which he must have done, he could not understand. The second shot went through his right arm and shoulder joint. It was the first wound that caused death. Both shots must have been fired within four or five feet of the victim. Corner was afterwards found in a field, with the right side of his face blown away, he having committed suicide. The father of the young man said his son was bitten by a viper nine years ago to the very day he committed the crime, and every year that day came round he was affected in a strange manner. The jury found that Corner murdered his master and then committed suicide, being in his right mind at the time. The murderer ran away and cut a stick from the hedge, placed it in the trigger, and, pointing the gun towards his head, released the trigger with the aid of his foot, the full charge entering his head and causing instant death.

3. **Evidence from the Proximity of the Weapon when Fired.**—Self-inflicted *accidental* gunshot wounds bear the characters of near wounds as a rule (*vide* pp. 554 *et seq.*); they may touch vital parts, but if the body has not been disturbed the presence or absence of design in the infliction of a wound is commonly made apparent by the relative position of the body and the weapon. They frequently arise from persons drawing the charges of guns or pistols with the muzzles pointed towards them, and they are then situated in front; at other times they are produced by persons pulling towards them through a hedge or dragging after them a loaded gun. In the latter case the wound is behind, and it may strongly resemble a homicidal wound, although the circumstances under which the body is found generally suffice to explain the matter ("Ann. d'Hyg.," 1860, 1, p. 443).

If an accidental wound be inflicted by a second person it is impossible, in the absence of evidence, to say that it was accidental or homicidal. It is very necessary in such cases to compare the particulars of the wound very carefully with the statements made by the person implicated; they may be such as to absolutely contradict in a most definite manner the evidence thus offered, especially in modern days,

when a prisoner, even in criminal cases, can be put in the witness-box if he wishes it.

The same nearness of the weapon will be found in the case of suicides, unless there is evidence of special design, such as a long string or stick; the wound is almost sure to be ragged and blackened or peppered with fragments of powder, etc. In the following case the reason for acquittal is not very clear, considering the proof of the wound not being a near wound :—

A case was tried (*Reg.* v. *Wilson*, Shrewsbury Aut. Ass., 1870) in which a medical student was charged with shooting at his father, a medical man, with intent to murder him. The prosecutor was lying asleep on a sofa in the evening, when he was suddenly awakened by a report of firearms and the sensation of an acute burning pain in the eye. This was followed by another report. He was unable to see for the moment, but fancied he heard the sound of footsteps between the two reports. A bullet was subsequently extracted from the eye, and another from the head. He fell off the sofa, and in raising himself up found a revolver on the floor at a short distance in advance of him. This was proved to be his own revolver. The prisoner had shortly before this gone downstairs in the direction of the room where his father was lying asleep. The prisoner called to his sister, saying that his father had shot himself. The medical evidence clearly showed that this was not such a wound as would have been produced by an attempt at suicide. It had none of the characters of a near wound. The prisoner had had some disputes with his father, but there did not appear to be a sufficient motive for such an act, although he had the means and opportunity. He was acquitted of the charge. It was suggested that some person might have entered the house and fired twice at the prosecutor while he was asleep, although there was no motive for shooting a sleeping man. The statement made by the son, that his father had shot himself, was proved to be untrue by the nature of the wounds.

The next case goes very near to a verdict of manslaughter for the same reason :—

In October, 1891, an inquest was held in Worcestershire on the body of a young man, when it was shown that the deceased and a friend were shooting together. According to the friend's evidence, the deceased got over a fence, and must have slipped in climbing a bank and shot himself. It was proved, however, that the marks of slipping were made by an unnailed boot, whereas those of the unfortunate man were heavily nailed, and that the shots in and about his head were only thirty in number and distributed in a manner which could not have been caused by the firing of a gun with shot cartridges close at hand. The distribution of the shots was such as might have been caused by the firing of a gun at a distance of sixteen yards, at which distance the friend said he was when the accident happened. The verdict was to the effect that the deceased was accidentally shot by a gun not held by himself.

4. **Evidence from the Position of the Weapon (when found) to the Body.**—Due allowance must be made for the unusual conditions under which the bodies of persons who have committed suicide by firearms may be found, or erroneous suspicions of murderous interference may be formed.

In 1868, a man was found dead on the floor of his bedroom, his body stretched out at full length, and both arms lying straight close to the sides of the body. A pistol-case was at a short distance from his right hand, and the left was gently closed on a piece of burnt paper without any blood on it, and the insides of the fingers were blackened. The pistol was lying near the *left* hand. On the right temple there was a deep wound, completely traversing the head, and having the characters of an entrance wound. Portions of brain and blood had been carried to the left side, covering some of the furniture beyond the body. On this side, too, a conical bullet was found within the fender, resembling those in the pistol-case. This was, it is believed, an act of suicide. The discharge of the pistol

was heard in an adjoining room by a servant, who stated that she heard the man speak immediately after the discharge of the pistol. The position of the pistol and the laid-out attitude of the body, the arms and hands close to the sides, might have fairly given rise to a suspicion of murder. The fingers of the left hand were blackened, but it is impossible to conceive that such a wound could have been inflicted on the right temple with the left hand, and then the question arose, How came the burnt paper (wadding) in the hand? If the pistol was discharged with the right hand, then how did it happen that the pistol was lying near the left hand on the left side of the body, while the right arm was stretched at full length on the right side of the body? It is probable that the man shot himself with his right hand while sitting on the floor, that the pistol dropped on his left side, and that he fell flat on his back, retaining sufficient power to place his arms by the sides of his body. The burnt paper and the blackening of the fingers remain to be explained. The left hand must have been held near the pistol when it was discharged.

In these cases, as in cases of actual murder, there are many mysteries which can only be unravelled by the person committing the crime. Such a case as the above might have easily given rise to a charge of murder.

The case of Risk Allah will furnish an additional illustration. A young man named Readly, to whom the accused was related by marriage, and by whose death he would inherit some property, was found dead in his bed at an hotel in Antwerp in 1865. Readly was subject to epileptic fits; and he had recently had a disappointment in reference to marriage. Risk Allah had insured the deceased's life for 1,000*l.*, but that was in order to cover a loan which he had made to him. The facts, as they transpired from an official inquiry at Antwerp, were these:—One morning the deceased had an epileptic fit, and his companion, Risk Allah, a medical man, having attended to him, left him to sleep, he himself sleeping in a corridor at some distance from the deceased's bedroom. At seven o'clock on that morning the chambermaid had gone into the deceased's room and had seen him asleep. At 7.30 Risk Allah was seen to come downstairs and to go out of the house, to which he did not return until just before nine o'clock, when the landlord said that, as they had neither seen nor heard anything of Readly since his fit, Risk Allah had better go and see how he was. The bedroom door was found fastened on the inside, and there was a strong smell of gunpowder smoke issuing from the keyhole. He immediately called for assistance. The door was broken open, and it was found on entering that furniture had been placed against it, and the room was full of smoke. A table and chair were found overturned. The deceased was lying on the bed, shot through the head. The body was naked, the night-dress which he had worn being in another part of the room, without any stains of blood upon it. Blood was still flowing from the wound, and one of the hands was warm. The right arm was across his stomach, and his left arm was lying by the side of his body. The left hand was almost out of the bed. A recently discharged gun and a ramrod were on the floor by the side of the bed, and there was a chair close by, which had been overturned. Some shots were also found. On a table in the room was a piece of paper on which were written, in the handwriting of the deceased, the words "I have done it," the ink being still *wet*. A trial took place, and the question was raised whether this was an act of murder or suicide. Risk Allah was discharged, and the act was pronounced to be one of suicide. Three years afterwards the whole case was gone into again in this country, on the occasion of an action for libel, in which the writer substantially charged Risk Allah with the murder of his companion (*Risk Allah* v. *Whitchurch*, Q. B., June, 1868), and a verdict, with heavy damages, was returned for the plaintiff. Apart from the fact that the accused was not proved to have been on the spot when the deceased received his death-wound; that the doors of the room were fastened on the inside; that the body when found was warm, and that coagulated blood was still oozing from the wound; that the ink on the paper with the words "I have done it" was still wet, and proved to be in the handwriting of the deceased, there was another circumstance pointed out on the trial for libel. The body was found naked on the bed, the night-dress being in another part of the room, not stained with blood. This seemed only consistent with suicide. The deceased slept in a night-dress, and was seen with one on that night. If shot by the hand of another, it cannot be

supposed that the murderer would have taken off the night-dress and stripped the deceased naked before firing the gun. Had it been possible to do this without causing a struggle and raising an alarm, there could be no conceivable motive for such an act. On the other hand, the deceased might have removed it to prevent its catching fire; but, whether this was or was not the motive, the deceased himself must have taken it off and placed it where it was subsequently found.

The position and attitude of the dead body were considered by some medical men to be inconsistent with suicide. One said that after a severe gunshot wound like this, involving the brain, it would be impossible for a person to place his arms by the sides of the body or to put his hands under the bedclothes. Another contended that a man could not possibly shoot himself with a gun while lying down in bed; but both of these propositions are contrary to fact. In a case of probable suicide related above, the arms were found straight down on each side of the body, the wound in that case traversing the brain and causing almost instantaneous death. In reference to the second point, there have been instances of soldiers destroying themselves by firing the gun while lying down by means of the ramrod, which appears to have been used for this purpose by Readly; and, in order to satisfy the jury, one of the military experts for the defence at the Antwerp trial lay down on a bed in court, and fired a gun by means of a ramrod. It was also proved that the wound in the body had the usual appearances of a near wound, which would be the result of a gun so fired. In short, there was nothing in the *medical* circumstances of this case which justified the charge of murder.

In relying upon the relative position to the deceased of a discharged gun or pistol, an expert, unless he has had a large experience in such subjects, may be easily deceived, and draw a false conclusion. In 1869, a gentleman was out shooting with a double-barrelled gun. He had just put on the percussion-cap, and was holding the gun loosely in his hands, when the right barrel went off. From the recoil, with nothing behind the butt, the gun flew back a yard or two behind him, and the cap of the left barrel came so sharply in contact with the hard ground, that it also exploded, sending the charge into the outside of the sportsman's thigh. The shot passed through the right-hand pocket of his shooting-jacket, striking his shot-bag, and driving the brass top into the muscles behind the hip-joint. The metal head of the shot-bag deflected the charge, so that it passed round outside the thigh and lodged in the muscles. This deflection probably saved his life, as no great vessel was wounded. Assuming that the man had been found dead under these circumstances, it might have been said that suicide and accident were impossible, that no man could have shot himself with a gun from behind in the manner described, and that the position of the gun, one or two yards behind the body, could only be explained on the supposition that some one had shot the deceased from behind.

A case of some interest in reference to the attitude of the body and position of the weapon in death from a pistol-shot wound is reported in the "Ann. d'Hyg.," 1868, 2, 445. Tonlmouche has also contributed several cases illustrating the effects produced by bullets and small-shot under different conditions ("Ann. d'Hyg.," 1867, 1, 403).

In one case (*Rex* v. *Adams*, Berkshire Ass., 1836), in which the prisoner was charged with the murder of his father, the gunshot wound which had caused death

was situated at the back of the head. No weapon was found near; hence there could be no doubt that this was an act of murder. The prisoner was acquitted, since, although he was seen running from the spot at or about the time of the murder, another gun was heard to be discharged from the same spot about an hour afterwards; and it was impossible, from a medical examination of the wound, to say at what particular time it had been caused. A somewhat similar case occurred subsequently (*Reg.* v. *Richards*, Warwick Lent Ass., 1843). The deceased was found dead, lying on his back, with his gun placed on the front of his body, reaching from his thigh to some inches above his head. On inspection it was ascertained that death had been caused by a gunshot wound at the back of the right ear. Two surgeons gave it as their opinion that from the position of the wound, the body, and the weapon, death could not have occurred from design or accident on the part of the deceased, but might have taken place from the accident of another. The prisoner was acquitted, as there was insufficient proof to connect him with the act.

There is, however, one position in which a weapon may be, which admits of very positive deductions, that is when the weapon is still *firmly* grasped in the hand of the dead man. This position proves most positively that the dead person fired the fatal shot himself (*vide* "Cadaveric Spasm"), but it does not of course prove whether he did it accidentally or intentionally; that must be left to other evidence to prove. The point may be extremely important, say for insurance purposes, and medical evidence of design may clear it up, but otherwise medical evidence alone is powerless.

The absence of the weapon clearly proved murder in the following case communicated to the editor by Mr. Nelson Hardy:—

One morning, four years ago, I was sent for to what proved to be a case of murder. The dead body of a young man of twenty or twenty-one years of age, who had apparently been killed while asleep, was lying on its right side, with blood on the pillows and sheet near his head. His face was discoloured, and rigor mortis was present. His watch and chain were safe under his pillow. There was a small round wound behind his left ear, from which blood and brain substance had oozed, and a wound an inch and a half long in his right forehead, with bruised edges, which reached to the bone. No pistol or weapon of any kind was found near the body, but a pistol, cartridges, and an old hammer, stained with what appeared to be blood, were found concealed in a box in another room. A brother of the deceased, with whom there had been some slight quarrel, and who had lived in the same house with him, his mother, and another brother, had not been seen since the murder, but, after keeping out of the way for several days, was arrested near the scene of the murder, and some of his blood-stained clothes brought to me for examination. At the post-mortem examination, on reflecting the scalp, a large amount of extravasated blood was found extending from the wound on the forehead to the occiput, and fractures extending through the frontal, temporal, parietal, and occipital bones. A flattened bullet, which had entered the skull by the wound behind the left ear, had left its track through the posterior lobe of the brain and the cerebellum in small pieces of bone, and was found an inch and a half above and behind the right ear, where it had fractured the bone, but was lying within it. The conclusions at which I arrived were—(*a*) that the pistol wound or the other injuries to the head were either of them sufficient to have caused death; (*b*) that the wounds could not have been self-inflicted; (*c*) that the pistol wound was the immediate cause of death. At the inquest a verdict of wilful murder against the brother was returned, but at the Old Bailey he was acquitted on the ground of insanity, and ordered to be detained during her Majesty's pleasure. It was believed that he had battered the skull in with the hammer which was produced, and then shot him, and it appeared that he had meant to serve his other brother the same way.

5. **Evidence from Direction of the Wound.**—The course taken by small-shot, when discharged at short distances, may indicate the direction in which the discharge took place, and thus

aid in the identification of the assailant. In *Reg.* v. *Marris* (Lincoln Lent Ass., 1870), it was a question whether the wound indicated the direction in which the gun was fired. The deceased was shot while passing along a public path. If the prisoner were guilty, he must have fired the gun from a window more than twelve feet above the ground. According to the evidence, the shot must have been fired downwards. It had blown away the upper lip, the teeth, and lower jaw. The prisoner was convicted.

In the following case the direction in which the bullet (taken with its nature) struck deceased, was a strong point in suggesting accident.

In January, 1904, an inquest was held by the East Cumberland coroner at Glassonby on the body of Mr. William Edwin Rowley. James Wilson, valet to deceased, said he left his master at half-past one on Thursday morning in the study. He had been drinking sherry, but was quite sober. At eight o'clock the same morning he found his master lying on the floor with a severe wound in his head. Deceased had not been in bed, and was still dressed in pyjamas and a coat. When witness went to bed a double-barrelled express rifle was in a cupboard. The gun had not been used by deceased previously, having just come from London. He did not know if it was loaded when he brought it into the house. He thought the gun had slipped and struck the fender, causing it to discharge. The bullet was explosive, and one of the kind deceased had used for killing big game in India. Dr. Winship said his opinion was that the explosion was quite accidental. The expanding bullet struck the top part of the deceased's head, whereas if Mr. Rowley had fired his face would have been shattered. The jury returned a verdict of accidental death.

In the following case the editor holds a strong view that medical evidence was strained beyond legitimate bounds.

In 1882 the celebrated trial of the brothers Peltzer took place for the murder in Brussels of M. Bernays in 1881. At this trial several important questions relative to hæmorrhage from gunshot wounds, the position of the assailant, and the production of cadaveric lividities, were raised. M. Bernays was a well-known barrister in Antwerp, and was on very intimate terms with Armand, the elder of the two brothers Peltzer, and was also known to the younger brother, Léon. Either on account of a *liaison* between Armand and Madame Bernays, or because M. Bernays was in the possession of a secret affecting the character of Armand, the latter resolved to get rid of Bernays, and employed for this purpose his brother Léon. Bernays was accordingly inveigled into a room in a house in Brussels, specially prepared for the purpose; and as he crossed the threshold it is supposed that the disguised Léon presented a pistol near the nape of the neck, and shot his victim dead. The body was no doubt subsequently disposed of by the brothers in the following manner. All traces of blood were removed from the room except in one spot, where there was a pool of blood weighing about nine ounces; and the body was placed in an arm-chair so that it might be supposed that death was the result of either suicide or accident. About a week later information was conveyed to the authorities by letter that Bernays had been shot accidentally by one Vaughan—an assumed name of Léon—during an altercation; and this letter led to the discovery of the deceased's body. A judicial and medical examination of the body was made on January 18th, eleven days after the death. Stienon, who made the medical examination, said there were two wounds, one on the right temple, of a simple nature, the other in the nape of the neck, which had been the cause of death. This was a perfectly clean wound, without any burn. The ball had gone through the neck from left to right, slightly ascending and perforating the skull. The principal part of the projectile was found in the right temporal (middle) lobe of the brain. On the body were stains of blood and cadaveric lividities. The blood-stains were in the nape of the neck, and on the right side of the head. On the nostrils and moustache were streaks of blood. There were lividities on the right leg and forearm. No blood was found in the pharynx. The wound in the nape of the neck could not have bled much externally. The bleeding had been internal, and through the nose. There was little blood on the clothes of

the deceased. A spot on the carpet contained nine ounces of blood. There was a footprint, as he alleged, in this spot not produced by the deceased. Experiments made for the purpose showed that the footprints could not have been produced earlier than two hours and a half after the blood had flowed on to the carpet, and probably it was twenty or twenty-five hours afterwards. [One would like to know the nature of these experiments. It is very difficult to see how they could prove any such thing as asserted.—Ed.] It was certain that the footprint was not produced on January 18th, the day of the first investigation at the house, and eleven days after the death. Experiments showed that cadaveric lividities could no longer be displaced when the body had remained in the same position for twenty-eight or thirty hours; therefore the body could not have become cold in the same position as that in which it was found. It might have been moved after twenty-eight or thirty hours, but the cadaveric rigidity must be taken into consideration. The body must have been rigid after twenty-four hours. Destruction of this rigidity was possible only by tearing the muscles [this is contrary to fact.—Ed.], and no muscles were torn: therefore it was probable that the moving of the body had been effected after cadaveric rigidity had disappeared, which usually happens after sixty or seventy hours. It followed that the body must have been moved some days after the crime. The blood clot on the carpet was irregular in shape, there being no blood in the centre; and the footprint was at the side. Death had doubtless been instantaneous; and experiments showed that the shot had been fired at a distance of four inches [wonderfully exact experiments to prove it was not three and a half or four and a half.—Ed.] from the wound, though there was no blackening. The clothes of the deceased were in perfect order, and there was no evidence of a struggle having taken place. Léon had indicated a spot where the shot was fired; but it was impossible that his victim could have been on that spot, as in that case the blood would have flowed all over his clothes, which was not the case. Bernays had evidently fallen against the corner of a writing-table, as was indicated by the wound on the temple, and had then rolled on to the floor. Probably the deceased was shot whilst stooping his head, as many people do instinctively on entering a room. Inside, on the door, were some drops of blood, spirted on it when the wound was inflicted. The victim had bled through the nose for five or ten minutes after death. If the assassin had raised the head of Bernays, the blood would have flowed on to the clothes, which were free from blood. The footprint on the blood clot on the carpet had probably been made by a boot of Armand's, with which the mark corresponded. The body had not been moved sooner than from forty to sixty hours after death. This was the summary of Stienon's evidence; and he was confirmed by Vleminckx. For the defence Guillery stated that what had been described as a footprint on the blood on the carpet had been produced by a knee, not a boot; and the impress might have been made ten or fifteen minutes after the blood had flowed. Hence it might have been produced, as Léon stated, when he knelt to raise the head of the deceased, and to render him assistance. Cadaveric lividities, he asserted, permitted no conclusions to be drawn, as twelve days after death they were accompanied by putrefaction. The blood, he contended, had flowed from the nape, not from the nose. Schönfield confirmed this evidence. The brothers Peltzer were both convicted (*B. M. J.*, 1883, 1, p. 23) [probably correctly, but surely not on such evidence as to lividities, distances, etc.—Ed.].

6. **Evidence from the Character or Nature of the Projectile or Wadding, etc.**—Useful evidence may be sometimes obtained by a careful examination of the projectile, which, if found, should be preserved. When the projectile cannot be found, and there are no marks of burning or other signs of a near wound on the skin, we must be cautious in expressing an opinion.

In the case of *Rex* v. *Howe and Wood* (Stafford Lent Ass., 1813), it was proved that the deceased had died from a gunshot wound in the back. The bullet extracted from the wound was found to have been discharged from a pistol with a screw-barrel. A weapon of this kind was found on the prisoner, as well as a bullet which had evidently been cast in the same mould as that taken from the body of the deceased (Wills's "Circ. Evidence," 246).

On these occasions the medical attendant should either keep possession of any of the projectiles which he may remove from a wound, or deliver them only into the hands of responsible persons. In gunshot wounds, the examination of wadding or paper found in a wound or near a dead body has in more than one instance led to the detection of the person who had committed a crime. His handwriting has been traced on the paper used as wadding, or it has been found to have been part of a printed page, of which the remainder has been discovered in his possession. When a gun is discharged near to the body, a portion of the wadding is often carried into the large irregular wound which is produced. This was part of the evidence in the case of *Reg.* v. *Blagg* (Chester Sum. Ass., 1857) :—

The peculiar character of the wadding found in the body connected the prisoner with the act. Whether the wadding is found in or near the body, it should be equally preserved. In *Reg.* v. *Richardson* (Lincoln Ass., December, 1860), the accused was convicted of murdering a policeman under the following circumstances :— He shot at the deceased, who was able before death to identify the prisoner; but, as the deceased was weak from loss of blood and failing in consciousness at the time, there was some difficulty in relying upon this dying declaration, especially as no other person witnessed the act. Some paper wadding had been picked up on the spot where the deceased fell; and a gun which had one barrel loaded, and one empty from a recent discharge, was found in the prisoner's house within twenty-four hours of the murder. The wadding in the loaded barrel consisted of a fragment of the *Times* newspaper of March 27th, 1854, and the charred and sulphurous pieces of wadding picked up on the spot were proved by the publisher of that journal, who was summoned on the trial, to have formed a portion of the same impression. The prisoner's counsel, in fact, could not deny that the act had been brought home to the instrument, if not to the agent, and though the explanation of the crime remained obscure to the last, and the motive unassignable, the aggregate evidence proved sufficient to convince the jury.

Such cases are now very rare indeed since the introduction of machine-made cartridges and wads made by the million precisely identical. Any projectiles found in a gunshot wound should all the same always be preserved for evidence.

In the case of Rush, who was tried and convicted, by a remarkable train of circumstantial evidence, of the murder of Mr. Jermy (Norwich Lent Ass., 1849), it was proved that the projectiles removed from the body of the deceased consisted of irregular pieces of lead (slugs). Similar masses were taken from the body of the son, who was killed at the same time. They were described by the medical witness as being angular, and quite unlike the shot used in killing game. Each piece weighed from eleven to thirteen grains, and there were fifteen pieces in all. As the judge remarked, this demonstrated that the two acts of murder were committed by the same person, or by this person acting in concert with others. In *The Queen* v. *Lloyd* (Shrewsbury Lent Ass., 1854), it was proved that the deceased had been killed by the discharge of a gun through a window. He was struck on the head by about thirty shots, one of which had penetrated the brain and caused death. The assailant was not seen, but the charge was brought home to him by numerous circumstances, among others by the discovery in one of his pockets of shot (Nos. 3 and 4) of the same sizes as those removed from the head of the deceased. The surgeon had removed and preserved the shot, so that they were afterwards available as evidence against the prisoner.

Facts of this kind may sometimes establish the innocence of suspected persons :—

In August, 1859, a man was shot at Sheffield while sitting in a room. He was wounded in the left temple, and the ball lodged behind the left eye. A man was arrested on suspicion, and on searching his house two pistols were found, one a

small one and the other several sizes larger. As the ball could not be removed, and the wounded man survived, no comparison could be made. In the meantime the prisoner was remanded. The wounded person died in March, 1860, from the effects of the injury. The ball was then extracted from the body and compared with the pistols. It was too small for one and too large for the other, so that it could not have been fired out of either. The man was discharged.

The **chemical analysis of a projectile** may be occasionally necessary. Old-fashioned common bullets are entirely formed of lead. Cast bullets are commonly found to have a void space in the interior when cut through the centre, owing to the exterior cooling more rapidly than the interior, and to the greater bulk of the metal when in a liquid state. In large bullets this cavity is frequently of the size of a barley-corn. Modern bullets obtained by compression have no such space, and are of greater specific gravity. Small-shot consist of lead with one two-hundredth part of arsenic. In the case of Rush above, type-metal was found in the house. This consisted of lead with one-fourth part of antimony, the latter being left by digestion in nitric acid. It was therefore considered advisable to examine the slugs chemically, and they were found to consist chiefly of lead, and to contain no antimony.

In the post-mortem examination of the body of a person who has been killed by a discharge of small-shot, the pellets do not always present a rounded appearance. By the force of the discharge, especially when near to the body, or when any bony surface has been struck, the spherical form of the shot may be almost entirely lost. In *Reg.* v. *Evans* (Swansea Lent Ass., 1869), it was attempted to connect the prisoner with an act of murder by the appearance of the shot removed from the dead body. Some slips of lead, with small cut portions of the metal of a rough cubic form, were found in prisoner's possession. A portion of the shot removed from the body of deceased, who was found dead, had a similar cubical form. They consisted only of lead, but it was impossible to say that the lead was the same as that found in the possession of the prisoner. The evidence failed to connect the prisoner with the act. Cut lead, in the form of slugs, may be mixed with shot, and it appeared to be so in this case. In all manufactured shot there is arsenic. If this is found, it would tend to show that ordinary shot had been used.

Now and again serious and even fatal accidents are reported from the toy pistols sold with paper caps to children. Fragments of the cap have been removed from the eye after causing severe damage.

When a gun or pistol is discharged at the distance of three or four yards from the person, it will not, of course, produce those marks of blackening, burning, and bruising on the skin which are found when the muzzle is within a few inches of the body. Such a wound may remove a suspicion of suicide, and create a strong presumption of homicide. Lachèse found that in firing a gun at the distance of four feet the skin was only partially blackened (*vide ante*, "At what Distance Discharged"). It would be very important in a case of this kind to notice the direction of the assailant with respect to a wounded person.

At a trial (*Reg.* v. *Currell*, C. C. C., March, 1887) for shooting, the exact weight of the bullets from a pistol before and after firing at an object, became a point of considerable importance, but the careful experiments and observations of Dr. F. H. Oliver completely refuted the suggestions for the defence. The man was found guilty and executed.

In February, 1898, a case of shooting occurred in Whitechapel (C. C. C., March, 1899, *Reg.* v. *Czerzewski*) which is well worth putting on record in full from many points of view. I am indebted to Dr. Oliver for the following account of it:—

The inquest lasted four days, and concerned the death of a woman (M. W.) and a man (C. K.), both Russian Jews, killed by pistol wounds. One witness said: "While we were all four" (*i.e.*, two men and two women; both of the latter were shot, one fatally, one non-fatally) "together in my room I heard some one running up the stairs shouting. I heard it was a man's voice, and he said: 'All of you, come out; I'll shoot the lot of you.' Directly I heard this I put my knee to the door, which was already shut, being afraid that the man would do some damage. Deceased put her shoulder to the door as well. There was no key to the door. Deceased advised me to get out of the way of the man. She must have recognised the man's voice. She did not mention any name. I could hear him get to the top of the stairs, and then I could hear pistol shots. I could hear the man swearing in Russian, and saying: 'Come out of it, or I'll shoot you all.' Then shots were heard, and there came two shots through the door, and then deceased fell down. I thought she had fainted. Adèle held hold of her own arm and said: 'I've been shot through the arm.' Directly after the two shots were fired the man outside started kicking at the door. I was holding the door at the bottom at the time with my knee. When the man outside kicked the door the panel cracked and burst in, and the man got in as the door was thus opened. Directly he got into the room the man held the revolver he had in his hand under my chin. I caught hold of his wrist, twisted his hand round, and the revolver went off, wounding the man himself, grazing his forehead."

Several witnesses testified to the fact that four shots were fired altogether, and it was also proved that the prisoner was in possession of a revolver at the time. The police produced the weapon seized from the prisoner at the time of the occurrence, with four chambers discharged and two undischarged, and also several loose cartridges, two picked up at the scene of the occurrence and some obtained from the prisoner's clothes and room, fitting the revolver.

Owing to discrepancies between the evidence of the police as to what they found on arrival and the evidence of other witnesses who were on the spot at the time, it became necessary to prove every step in the prosecution most carefully.

Dr. Oliver's evidence on the woman ran as follows:—"About 8.15 p.m. I was called to 115, Brick Lane, and viewed the dead body of deceased woman. She was lying on the floor at full length in the top floor back room. I was informed by Sergeant French that the position of the body had been shifted. She was dead, and, after removing the clothing, a wound was found in the left shoulder. I made a post-mortem examination of the body at 6.20 p.m. on Sunday, February 6th, 1898. Rigor mortis was still present, and post-mortem staining was well marked. On the front of the left upper arm, two inches and a half from the summit of the shoulder and one inch to the outer side of the upper limit of the anterior fold of the axilla, there was a punctured wound, and on the right side in the mid-axillary line on a line with the lower border of the right breast, nearly protruding through the skin, a foreign body was to be felt. An incision was made over the point, and the bullet produced was removed. The skin here for an area as large as a five-shilling piece was discoloured, and the tissues beneath infiltrated with blood. There were no other external marks of violence.

"The circular wound on the left shoulder was one-third of an inch in diameter, with jagged inverted edges. On tracing this wound it was found to pass through the soft structures forming the armpit, which were infiltrated with blood. It then entered the left chest by passing through and shattering the upper surface of the fourth rib just beneath the anterior fold of the axilla. It then passed through the left lung, the pericardium, the aorta at its commencement, the right lung, and the upper surface of the eighth rib, shattering the latter, to the point previously described on the right side. The chest cavity and pericardium contained large quantities of blood clot. No disease existed in the lungs, and the other organs were healthy. The bodice worn at the time showed a perforation corresponding with that in the shoulder.

"In my opinion the cause of death was hæmorrhage from lungs and aorta being traversed by a bullet.

"The bullet is apparently of the same size as that in the body of the man."

On the man Dr. Oliver gave evidence as follows:—"The dead man was lying on the back at the top of the stairs on the top floor landing, with feet directed to the door of the top front room; his head was resting on the top of the stairs immediately against the wall forming the back of the house; his face was looking upwards, directed slightly to the right; right arm lying across the chest, the left arm lying at full length by his side; palm of left hand turned upwards towards the left knee; tho left leg drawn upwards, the knee directed towards the palm of the left hand; left foot lying below the lower third of right thigh; tho right leg was fully extended. The position of the body was such that the right side of the body formed a curve, the convexity looking towards the wall of the passage.

"There was a wound in the left temple midway between the ear and the external angle of the left eye. There was vomit and blood on the passage floor.

"I made a post-mortem examination of the deceased. The body was well nourished. He was a well-developed muscular man, five feet seven inches and a half high. Rigor mortis still present, and post-mortem staining well marked. Both hands smelt of vomit, and were blood-stained. Over the right eyebrow there was a superficial dry scar, measuring five-eighths by one-third of an inch. This is an old injury and trivial. Midway between the left ear and external angle of the left eye the skin was discoloured to about the extent of a penny piece, and in the centre of this there was a circular punctured wound with inverted and jagged edges. This measured a quarter of an inch in diameter. There was no evidence of burning or discoloration by gunpowder. On reflecting skin a considerable effusion of blood was found among the contents of the temporal fossa. The zygomatic arch was shattered, and the temporal bone was shattered at a spot corresponding to the external wound. On removing the scalp, skull-cap, and covering of the brain, a considerable quantity of blood escaped. The bones forming the middle fossa of the skull had been shattered, as had also the body of the sphenoid.

"*Brain.*—Congested, especially the left side, and the bullet produced was found within half an inch of the upper surface of the left brain, near the middle line, immediately above the shattered body of the sphenoid. The substance of the brain was torn up along the track the bullet took. There was bloody effusion into the substance and upon the substance of the brain. There were numerous small spicules of bone adhering to the base of the brain. The direction taken by the bullet was from before and backwards across the base of the skull and very slightly upwards. The inclination was, however, very slight, and the direction was almost horizontal and directly across. From the puncture on temporal bone two small fractures were to be seen, one running slightly upwards and forwards towards the orbit, the other running backwards and inwards towards the middle line. Other organs healthy, no sign of disease.

"In my opinion the cause of death was shock from fractured skull and lacerated brain by means of a bullet. The bullet was not fired quite close to the deceased."

Dr. Oliver then deposed that he had weighed bullets taken from some undischarged cartridges (found by the police) and compared them with the weight of the bullets taken from the dead bodies. The difference was satisfactorily accounted for by fragments adhering to bones in each case.

The distance at which the shots were fired then became material to the case. Dr. Oliver deposed that he had found ingraining by gunpowder and scorching on the panel of the door through which two shots had passed. He made six experiments with the pistol and cartridges exactly like those used: (1) Touching a card, the card was very much scorched some two inches and a half round the bullet hole; (2) at three inches still scorching in a circle about two inches in diameter, and considerable ingraining of powder; (3) at six inches still some scorching and much ingraining, the scorching less and the ingraining more than at three inches; (4) at twelve inches no scorching, but still much ingraining; (5) and (6) at eighteen inches and two feet still slight powder marks, at three and four feet no powder marks were obtained. He then experimented on a cadaver. The results precisely corresponded, except that the card actually caught fire at the three-inch range.

In order not to rely entirely upon his own experiments, Dr. Oliver obtained the following opinions from eminent men, which are worth putting on record:—

Sir Henry Littlejohn says: "At least one foot and a half was the distance the piece was fired."

Sir William MacCormac says: "If the discharge was within a foot or so there would be some ingraining of powder. It is hardly possible to do more than guess beyond this."

Surgeon-Colonel Stevenson, Professor of Military Surgery at Netley, says: "I don't think that any one could give any valuable opinion on the distance at which the revolver was fired from the data supplied. 'No burning or discoloration by gunpowder,' and 'the entrance wound through the skin was less in diameter than the bullets,' are in general terms against the eighteen-inch range."

Mr. Bond says: "I have no doubt the pistol was less than a yard from the man, otherwise there would have been no ecchymosis and jagged edge to the wound. The two conditions are caused by the explosion being so close that it contused the skin and tore open the wound. With so small a charge of powder, the pistol can be held very near without burning the skin."

Dr. (now *Sir Thomas*) *Stevenson* says: "It is impossible in treating such a wide subject as gunshot wounds to be precise, for what applies to one weapon does not apply when a different kind of weapon is under consideration. I am unable to put a numerical value on the expressions you quote. I have no special knowledge of gunshot wounds, which demand very special knowledge. I always advise my class to experiment with reference to a particular case with a weapon and ammunition of the same size and make as those presumptively used. Weapons vary so much that anything short of this is inadequate."

In the result the prisoner was found guilty of manslaughter and condemned to ten years' penal servitude.

The first witness's evidence is interesting *re* accidental bullet wounds when two people are struggling. As regards the distance at which the shot was fired, there can be no doubt that there was not sufficient evidence to establish the exact distance, and equally no doubt that Sir Thomas Stevenson is right. General deductions are very fallacious, and special experiments must be made in each case if reliable results are to be obtained.

9. Identity from the Flash of Gunpowder.

Among the singular questions which have arisen out of this subject is the following: Whether the person who fires a gun or pistol at another during a dark night can be identified by means of the light produced in the discharge. This question was first referred to the Class of Physical Sciences in France in 1809, and they answered it in the negative. A case tending to show that their decision was erroneous was subsequently reported by Fodere. A woman positively swore that she saw the face of a person, who fired at another during the night, surrounded by a kind of glory, and that she was thereby enabled to identify the prisoner. This statement was confirmed by the deposition of the wounded person. Desgranges performed many experiments on this subject, and he concluded that on a dark night, and away from every source of light, the person who fired the gun might be identified within a moderate distance. If the flash was very strong, the smoke very dense, and the distance great, the person firing the piece could not be identified. The question was raised in this country in the case of *Reg.* v. *White* (Croydon Aut. Ass., 1839). A gentleman was shot at while driving home during a dark night; and he was wounded in the elbow. When he observed the flash of the gun, he saw that the piece was levelled towards him, and the light of the flash enabled him to recognise at once the features of the accused. In cross-examination he said he was quite sure he could see the prisoner, and that he was not mistaken as to his identity. The accused was skilfully defended, and he was acquitted. Evidence of this kind has, however, been received in an English court of law. A similar case was tried at the

Lewes Lent Assizes, 1862 (*Reg.* v. *Stapley*). The prisoner shot at the prosecutor, a gamekeeper, on a dark evening in December, and the latter swore that he distinctly saw the prisoner by the flash of the gun, and could identify him by the light on his features. His evidence was corroborated by three other witnesses who saw him not far from the spot, and by one who saw him in the act of running away. He was convicted. A case is quoted by Paris and Fonblanque (*Rex* v. *Haines*) in which some police officers were shot at by a highwayman during a dark night. One of the officers stated that he could distinctly see, from the flash of the pistol, that the robber rode a dark brown horse of a remarkable shape in the head and shoulders, and that he had since identified the horse at a stable in London. He also perceived, by the same flash of light, that the person had on a rough brown great-coat. This evidence was considered to be satisfactory.

From the information which the author was able to collect on this point, there appears to be no doubt that an assailant may be thus occasionally identified.

10. Imputed or Self-Inflicted Non-Fatal Gunshot Wounds.

Pistol-shot wounds are sometimes voluntarily inflicted for the purpose of imputing murder or extorting charity. A man intending to commit suicide by firearms, and failing in the attempt, may also, from shame or a desire to conceal his act, attribute the wound to the hand of an assassin. In examining such imputed wounds they will not be found to involve vital parts, except in cases of attempted suicide, and they will possess all the characters of near wounds produced by gunpowder, wadding, or a bullet (see "Gunshot Wounds"). The skin around will be more or less lacerated and bruised; there will be much ecchymosis; and the hand holding the weapon, as well as the dress and the wounded skin, may be blackened or burnt by the exploded gunpowder. A pistol-shot wound from an assassin may be produced from a distance, while an imputed wound which is produced by a person on himself must always partake of the characters of a near wound. If the weapon has been charged with nitro-powders, there will be no marks of blackening on the person or dress, but there may be marks of burning.

11. When was this Firearm Discharged?

An attempt has been made by French medical jurists to determine for how long a period a gun or pistol found lying near a dead body may have been discharged; but it is out of our power to lay down any precise rules on such a subject. All that we can say is, a quantity of sulphide of potassium, mixed with charcoal, is left adhering to the barrel of the piece when *recently* discharged; and this is indicated by forming a strong alkaline solution with water, evolving an odour of sulphuretted hydrogen, and giving a deep brown precipitate with a solution of acetate of lead. After some hours or days, according to the degree of exposure to air or moisture, the saline residue becomes converted into white sulphate of potassium, forming a neutral solution with water, and giving a white precipitate with acetate of lead. If a

considerable time has elapsed since the piece was discharged, oxides of iron with traces of sulphate may be found. (See "Ann. d'Hyg.," 1834, 1, p. 458; 1839, 1, p. 197; 1842, 1, p. 368.) This subject excited some attention at a trial which took place in France in reference to the death of M. Dujarrier. It was here considered of some importance to determine whether, by the mere discharge of powder, such a deposit of charcoal or powder took place at the mouth of the pistol as to soil the finger when introduced three hours after the alleged discharge. Boutigny conducted the investigation, and found in his experiments that the finger was not blackened under the circumstances. He considers that sulphate and carbonate of potassium are rapidly formed, and that the charcoal is entirely consumed. The facts proved at the trial were, however, adverse to the view thus taken. The result produced by a discharge of powder in the way supposed must depend on the quantity of powder employed, its perfect or imperfect combustion, and the proportion of charcoal contained in it ("Ann. d'Hyg.," 1848, 1, 392).

The editor leaves the above in Dr. Taylor's own words; he has been unable to find any more recent references to experiments on the subject, and it seems likely that for black powder the above is correct.

With regard to the nitro-powders now almost universally used, there is this difference between them and black powder: they are each a definite chemical compound when used, and the individual grains therefore either explode or do not explode, but, so far as the editor is aware, they do not leave behind them any products liable to undergo further changes by lapse of time; the old black powder was a mixture which on explosion underwent chemical changes, but the grains that escaped ignition, as well as grains incompletely ignited, probably did leave behind, as above, products capable of further change.

The editor has noticed in shooting that white particles undoubtedly collect in the barrel mixed with darker ones, but he is unable to find that any experiments have been made to determine the character of these particles.

It hardly needs mention that if the weapon has been cleaned there will be no evidence of "when discharged" except for rust and other such general indications.

SECTION VIII.

DEATH FROM LIGHTNING AND ELECTRICAL CURRENTS.

Death by lightning is sufficiently common to require that a medical jurist should be prepared to understand the phenomena which accompany it; but there is a more important reason why he should devote some attention to this subject; that is, that the appearances left by the electric current on the human body sometimes closely resemble those produced by great mechanical violence. Thus a person may be found dead in an open field, or on the highway; his body may present the marks of contusion, laceration, or fracture; and to one unacquainted with the fact that such violence occasionally results from electricity it might appear that the deceased had been maltreated and probably murdered. The greater number of deaths from the electric current take place during the spring and summer. According to one annual report, there were 24 deaths from lightning during the year, occurring in the following seasons:—Summer, 11; spring, 10; autumn, 2; winter, 1. Out of 103 deaths from lightning in five years (1852–56), there were 38 in the month of July and 22 in August. In fourteen years (1853–65) 242 deaths from lightning were registered in England and Wales, of which 199 were males and 43 were females. The numbers in each year fluctuate considerably. Nearly all the deaths took place among persons engaged in work out of doors, *i.e.* field-labourers and others. We less often hear of persons being killed by lightning in dwellings. In 1891 there were 20 deaths registered from lightning in England and Wales. In 1901 there were 16 deaths from lightning registered in England and Wales and 6 deaths from industrial electric currents, which latter seem likely to steadily increase in frequency.

SYMPTOMS OF A SHOCK BY LIGHTNING OR ELECTRICITY.

In many cases symptoms can hardly be said to exist, death being practically instantaneous, but in those who recover, many symptoms are described as occurring at the time, and many most important results have appeared subsequently. In general there is no sense of pain, and the person falls at once into a state of unconsciousness. Cunningham alludes to sixteen men who recovered after electric shock. He states that consciousness was not immediately lost, and that the men had experienced a sensation of tremendous pressure across the chest. One man shortly after regaining consciousness vomited (*B. M. J.*,

December 30th, 1899, and *New York Med. Jour.*, 1899). In a case which did not prove fatal, the person, who was seen soon after the accident, was found labouring under the following symptoms:—insensibility; deep, slow, and interrupted respiration; entire relaxation of the muscular system; the pulse soft and slow; the pupils dilated, but sensible to light. It will be seen that these are the usual symptoms of concussion of the brain. The effect of a slight shock is that of producing stunning; and when persons who have been severely struck recover, they suffer from noises in the ears, paralysis, and other symptoms of nervous disorder. Insanity has even been known to follow a stroke of lightning (Conolly's "Report of Hanwell," 1839). In one case the person remained delirious for three days, and when he recovered he had completely lost his memory (*Lancet*, August 3rd, 1839, p. 682). A boy, æt. 4, received a severe shock on May 11th, was seized with tetanus on the 13th, and died in four hours (*Med. Times and Gaz.*, 1855, 1, p. 533). In another instance an old man who took shelter under a tree felt as if a vivid flash had struck him in the face; he did not fall, but he became almost blind. He suffered for some days from frontal headache, and loss of sight supervened (*Med. Times and Gaz.*, 1858, 2, p. 90).

A person may, however, linger, and die from the effects of cardiac failure, severe lacerations, or burns indirectly produced. A case occurred in London in 1838 where death was thus caused indirectly by the effects of electricity. The following case of recovery illustrates further the action of the electric current:—Three persons were struck by lightning at the same time. In one, a healthy man, æt. 26, the symptoms were severe. An hour and a half after the stroke he lay completely unconscious, as if in a fit of apoplexy; his pulse was below 60, full and hard; his respiration snoring; his pupils dilated and insensible. There were frequent twitchings of the arms and hands, the thumbs were fixed and immovable, and the jaws firmly clenched. Severe spasms then came on, so that four men could scarcely hold the patient in bed; and his body was drawn to the left side. When these symptoms had abated he was copiously bled; cold was applied to the head, a blister to the nape of the neck, and mustard poultices to the legs. Stimulating injections and opium were also administered. In the course of twenty-four hours consciousness slowly returned, and the man soon completely recovered. The only external injury discoverable was a red streak, as broad as a finger, which extended from the left temple over the neck and chest; this disappeared completely in a few days (*Brit. and For. Med. Rev.*, October, 1842). These red streaks or marks sometimes assume a remarkable disposition over the skin. (See cases *Edin. Med. Jour.*, 1883, 2, p. 560.)

It is doubtful how far these nervous symptoms are the result of fright, and how far they are actually due to organic destruction of nerve-cells or fibres from the immediate effects of the electrical current. It would seem probable that *permanent* blindness and *permanent* paralysis are due to the latter, while other symptoms may be ascribed to the former.

An involuntary cry is described by all observers as occurring in cases of any severity, as in accidents in or about electrical workshops. (*Vide* Clifford Allbutt, "Syst. of Med.," vol. 5, article by Oliver.)

It is important to note the occurrence of these sequelæ after lightning where no compensation claim ordinarily occurs, because of their bearing on alleged symptoms, in cases where claims for compensation may be made.

A man was struck by lightning. Externally there was a burn upon the nape of the neck, where a metallic watch-guard rested; and from the point whoro the current of electricity left the chain tho skin was blistered in a straight line down to the foot, and tho hair of the pubes was scorched in its course. His intellect was confused, and his general condition was that of collapso. With the aid of stimulants, he becamo sufficiently restored to describo his feelings. There was paralysis of the lower extremities, with loss of sensibility (anæsthesia) and retention of urine. He was doaf, and complained of a noise in his ears liko thunder; he had somo difficulty in articulating, pain in swallowing, and a peculiar metallic taste in his mouth. The anæsthesia passed away in half an hour, but he did not completely recover the use of his limbs for four days; the bladder was paralysed for twenty-four hours, and by the catheter a highly coloured urine, with abundance of phosphates, was removed. The bowels were confined. All these symptoms gradually disappeared, excepting slight deafness; and he was discharged convalescent.

TREATMENT OF PERSONS WHO HAVE BEEN STRUCK BY LIGHTNING OR SHOCKED BY ELECTRICITY.

Most of the cases will be either dead or require no treatment beyond bodily and mental rest, with a little stimulating restorative. In some few cases, however, treatment may be of avail, and the only form in which it has proved of value is that of artificial respiration. (*Vide* Oliver, *l.c.*, where he quotes a case in which he was thus able to resuscitate a dog apparently dead from electrical shock.)

THE CAUSE OF DEATH FROM ELECTRICITY OR LIGHTNING.

In the *B. M. J.*, January 15th, 1898, Professor T. Oliver and Dr. R. A. Bolam state that they have obtained evidence which suggests that failure of the respiratory centre is not the cause of death in fatal cases of electric shock. On the other hand, their experiments with alternating currents, admittedly the most dangerous, appear to afford ample demonstration of the fact that death in such a case results from sudden arrest of the heart's action. In some instances in which there were very high voltages, with currents considerably above the potential usually required to kill the animal, there seemed to be contemporaneous cessation of the respiration and of the heart's action, but in most cases the heart was first affected. Primary cessation of the beat of that organ is, therefore, the general rule, and under no circumstances were the experimenters successful in causing primary arrest of respiration, followed by failure of the heart.

Dr. Lewis Jones in *B. M. J.*, March 2nd, 1895, says:—

"The mode in which electric shocks cause death is one of considerable interest, because it underlies the questions of the prevention of such accidents and of the mode of treatment when they arise. Recently attention has been called to this question afresh by the writings of Professor d'Arsonval on the subject, which have given rise to much discussion in the technical journals and in the public press. His belief is that it is not the heart, but rather the respiration, which

fails. He has even declared that in his opinion the criminals executed by electricity in the United States died from the effect of the post-mortem examination, that the shocks had only rendered them insensible, and that they might have been revived by artificial respiration."

He then relates his own experiments, which agree with the results of Oliver and Bolam in the main, though all these experimenters think that the actual mode of death may depend upon the seat of entrance and exit and the path of the current, so that it may occasionally happen that respiration fails first, but ordinarily it is the heart.

The references given above contain much interesting material in the details of the experiments. (*Vide* also *B. M. J.*, 1, 1902, p. 598.)

It must be admitted, on the other hand, that electricity, especially the enormously powerful current causing lightning, sometimes kills by a disruptive action upon the tissues in general, at least in many separate paths. There is a central core to the area of disturbance, but the sides of this area by no means escape the influence. The conductivity of the body is probably some million times less than that of copper and other metals known as good conductors, and hence great damage may be done when electricity tries to penetrate the body.

POST-MORTEM APPEARANCES IN DEATH FROM LIGHTNING OR ELECTRICITY.

Externally.—The suddenness of death is such that the body sometimes preserves the attitude in which it was struck. The pupils are always widely dilated immediately after death. Generally speaking, there are externally marks of contusion and laceration about the spot where the electricity has entered or passed out; sometimes a severe lacerated wound is found; on other occasions there has been no wound or laceration, but an extensive ecchymosis, which, according to Meyer, is most commonly seen on the skin of the back. In several instances there have been no marks of external violence, and it frequently happens that they are so slight as to require careful search. The clothes are in almost all cases rent, and partly singed, giving rise to a peculiar odour of burning, sometimes even torn into shreds and carried to a distance. Metallic substances about the person present traces of fusion, and articles of steel have been observed to have acquired magnetic polarity. It has frequently been noticed that, while much violence has been done to the dress, the parts of the body covered by it have escaped injury. Rigor mortis is stated to be sometimes absent (*vide* "Rigor Mortis"), but this probably varies with the nature and direction of the currents, for in many cases it has been observed to occur as usual (especially *vide* a case below, where it was still present eighty-eight hours after death).

Wounds and Burns are sometimes met with on the body. The wounds have commonly been lacerated punctures, like stabs produced by a blunt dagger. In the case of a person who was struck, but not killed, a deep wound was produced in one thigh, almost laying bare the femoral artery. This person was struck while in the act of opening an umbrella during a storm. Fractures of the bones have not been

commonly observed. In one case the skull was severely fractured, and the bones depressed. Wilks, in the "Trans. Clin. Soc., London, 1880," describes a case where lightning produced a compound fracture of the tibia, and the case, curiously enough, did not prove fatal. The burns, if produced by the current, are usually deep, but limited in area, but they are as commonly produced by the smouldering clothes or by fused metallic substances which have been on the person when struck by lightning. The curious vagaries of lightning in burning tracks of skin or hair on the surface of the body must also be noted.

Ecchymoses of greater or less extent are sometimes found on the bodies of those who have been killed by lightning. Besides these definite bruises, markings of a peculiarly arborescent form have frequently been noticed on the skin of persons struck by lightning. "They are caused by divarications of portions of the discharge producing a kind of specialised erythema; they resemble, both in appearance and in causation, the well-known Lichtenberg figures of experimental electricity" (Mann, "For. Med.," p. 239). On the other hand, it occasionally happens both in death from lightning and from electric currents that absolutely nothing can be found either externally or internally to indicate the cause of death, a point to be noted when legal questions arise concerning "was this man killed by electricity, or was he dead before touching the wire?" Mann communicated to Dr. Stevenson the case of a man killed by lightning on whom no lesions were found. The blood coagulated, and post-mortem rigor came on as usual.

Internal Appearances.—These present nothing that can be described as characteristic, unless in correspondence with some external marks. The blood is usually described as remaining fluid for a long time, and putrefaction is alleged to set in very early, but these are by no means peculiar to deaths from electricity. Extravasations of blood in the cranial cavity have been described, and also similar ones in the chest and elsewhere, but only in connection with damage done to the tissues overlying the part. Dr. Lewis Jones suggests that when such are found they may be the result of violent muscular tetanus, caused by the shock and rise in blood pressure (*B. M. J.*, March 2nd, 1895).

The following cases illustrate the above description:—

Lancet, July 20th, 1901: two fatal cases:—

"Two deaths are reported from Sussex during the thunderstorm on July 6th. Both victims were agricultural labourers, and were at work in the fields at the time the storm burst over the district. When the rain came on one sought shelter in a shed situated under some trees, the building having a corrugated iron roof. The lightning struck the building. The labourer was also struck, and, according to the evidence of the medical witness, it was his opinion that the lightning left the deceased by a chain which hung out of his pocket, and to which two knives were attached. Rigor mortis set in quickly. In the other case the victim was seeking shelter when he was struck down. He was found in a field drain. His clothes were smouldering. The skin on the right side of the face resembled the condition found in the second stage of burning. The body was scorched in places. Both deaths occurred within a few miles of each other in the Ashdown Forest district."

Lancet, December 3rd, 1892: industrial accident reported by H. A. Clowes, fatal:—

"On the afternoon of November 9th T. P. L., aged twenty-three, an employé of the House-to-house Electric Supply Company, was engaged in making connection with a house in Roland Gardens, Old Brompton Road, and while working in the surface box he was observed to fall to one side as if in a fit. A fellow-workman ran to him and found him with his left arm contracted, and attached by his left hand to the connecting wire. The wire was immediately broken by a blow with an axe handle, and when released he gave a loud sigh and fell forwards on to his forehead, but made no further movement or sound. He was brought in a cab to the Queen's Jubilee Hospital, where I saw him about five minutes after the occurrence. The heart and respiration had then stopped. The face, neck, and upper extremities were congested, the eyes suffused, and the pupils widely dilated. The features were not distorted, and the face wore a peaceful expression. There was a strong smell of burning not unlike the smell of gas, and it was at first reported that the man had fallen down while working on a gas main. The palm and first two fingers of the left hand were burnt and charred, and the fingers were strongly flexed. The clothing was not burnt or injured in any way. Artificial respiration was at once commenced, and was maintained for more than an hour, but the patient did not respond in any way, and it was evident that the case was hopeless. Besides artificial respiration, an injection of strychnia was given, with the idea of stimulating the respiratory centre, and the faradaic current was applied to the precordia. At the inquest, which was held on November 14th, the current which the man received was said to have been a rapidly alternating one (10,000 alternations per minute), of a strength of about 2,000 volts. It was not clearly shown how he had completed the circuit, for at the time of the accident he was holding only one wire with the left hand, which was burnt, but there was no other burn on any part of the body. The piece of wire which he held had in some way become denuded of the insulating rubber. A post-mortem examination was made three days and sixteen hours after death. The body was that of a well-developed, muscular young man, and the congestion of the face, neck, and upper extremities, and ocular conjunctiva remarked at the time of death was still noticeable. Rigor mortis, which had set in shortly after death and had been strongly marked, was still present to a slight extent in the lower extremities. Decomposition was not advanced in any unusual degree. The whole of the palmar surface of the forefinger and middle finger of the left hand was burnt, and the tissues of the carpal half of these two fingers were destroyed and carbonised, exposing the flexor tendons. The epidermis generally of the palm of the hand, the palmar surface of the thumb and of the cleft between the thumb and index finger, was burnt black, and separated from the deeper structures of the skin. On the dorsal surface of the hand, between the thumb and index finger, the epidermis was destroyed and missing over a surface the size of a florin. There was a small circular abrasion, not a burn, on the outer side of the right knee, and a small ecchymosis and swelling over the right frontal eminence. There were no other external marks of injury. The vessels of the

scalp, meninges of the brain and brain substance, were congested and full of liquid blood, and the surface of the white substances when cut across presented a punctate appearance. The lateral sinuses were full of liquid blood, and the lateral ventricles contained a fair amount of cerebro-spinal fluid. The brain and cerebellum appeared quite healthy. The mucous surface of the larynx, trachea, and bronchi was much congested, and the lungs loaded with dark blood. The heart was normal in size and consistence, and its valves healthy. Although not contracted, its cavities were completely empty, and there was a deficiency of blood in the large vessels. The liver was much congested and of a dark red colour. The spleen was large and engorged with blood. The kidneys were large (especially the left), congested, and the condition of the tissues doubtful; the stomach and intestines were normal in appearance; the bladder contained about eight ounces of highly albuminous urine. A marked feature of the examination was the complete fluidity and dark colour of the blood, not a clot being discovered in any part of the body. My colleague Dr. Thudichum, who kindly made a microscopic examination of the blood and nerve tissues, supplies the following note: 'Blood quite fluid, without any coagula, and remains fluid on being kept; medulla oblongata and amido-myelin coagulated; no other structural change.' He adds: 'Electrical current derived from wire to earth 10,000 alternations per minute, causing 20,000 shocks of contraction per minute, practically tetanus.'"

B. M. J., October 23rd, 1897, reported by C. F. Glum: fatal case of lightning stroke:—

"On April 28th, 1897, about 4 p.m., during a thunderstorm of unusual severity, I was called out to see G. C., farmer, aged fifty-four, who, it was stated, had apparently been struck dead by lightning about half an hour before. On arrival about half an hour later I found the man dead, and lying on the kitchen floor, where he had been placed when brought in. I was told that at the commencement of the storm he had said to his wife that he would go out to the field just behind the house to drive in some cattle to shelter. Shortly afterwards he was found about thirty yards from the house lying dead at full length, with his face downwards, his right hand in his trousers pocket; a small pool of blood was under his head; his hat (a black felt one) was lying about a yard away, and was torn almost to pieces. Both cloth leggings were torn almost from top to bottom, and a small piece of one was lying near. On proceeding to examine the body I found over the situation of the upper anterior angle of the left parietal bone a wound the size of a penny, the soft structures of which were quite disorganised down to the bone, but the bone appeared uninjured. The hair round the wound was burnt, and a good deal of blood was coagulated in the hair around. From the direction of this wound a red line of hyperæmia about a quarter of an inch broad could be distinctly seen running in an oblique direction down the neck and over the middle of the clavicle to the epigastrium. The hair of the neck and body was burnt and singed along this line, and there was a strong smell of burning when the clothes were removed. At the epigastrium this line merged into a diffused hyperæmia, which involved the whole of the lower half of the trunk and both the thighs. The hyperæmia

ended at the knees, but a red line similar to that above described ran down the outer side of the right leg and foot to the little toe. The inner surface of the right boot was torn along a line corresponding to this. On the under-surface of the left foot, just below the instep, was a fresh bleeding wound the size and shape of a threepenny piece. There were two bullæ about the size of a man's thumb in the left groin. On removing the body upstairs the wound on the head began bleeding again, so freely that a considerable pool of blood (about half a pint) was formed on the floor; this would appear to indicate an abnormally fluid state of the blood. The face was very livid. There was no watch or any other article whatever found in the pockets. There was an iron wire round the brim of the hat, apparently used for stiffening purposes; the hat itself was torn to pieces, leaving this exposed."

Lancet, November 8th, 1902, reported by P. Bellis: non-fatal case of lightning stroke:—

"In the early part of November, 1901, a column was resting at Great Oliphant's Nek, in the Transvaal, when a thunderstorm of great severity burst over the country. A non-commissioned officer was sleeping with three other men in a tent, when suddenly an electric discharge killed his companions. The man experienced what he described to me as a 'throbbing burning' pain in his right elbow and 'pin and needle' sensations extending 'down the thigh and leg of the same side and lasting a few minutes.' He then for half an hour lost the use of his arm and leg, but consciousness never left him. The patient's wounds were dressed, and he was taken to Middelburg Hospital. He was ultimately admitted under my charge into the surgical section of No. 22 General Hospital, Pretoria, on November 19th. On examination I discovered an extensive granulating ulcer on the outer surface of the right elbow and on the outer surface of the right thigh concentric punched-out-looking scars, five on the outer surface of the leg, one over the external malleolus, and one over the ball of the little toe. They varied in size from a half-crown to a threepenny-bit. The scars corresponded to sixteen exactly circular 'pinhead' perforations in his riding breeches and socks. There was a mere trace of charring at the periphery of the punctures. There was neither anæsthesia nor atrophy of the muscles. The knee-jerk reflex was absent on the affected side, but the other reflexes were normal. There was no reaction of degeneration. Pressure over the brachial plexus and over the great nerves in the upper part of the arm elicited a feeling of 'electric shocks' and visible tremors of the whole limb. There was no result on applying similar tests to his leg. Four times a day for the previous fortnight at regular intervals the patient had an attack of 'tremors' in his right arm and leg, which lasted for fully five minutes. He complained of no pain during these attacks, but said that he had a feeling of loss of power. The attacks suddenly ceased. The patient had no trouble throughout with his bladder or rectum. He was under my charge for about sixteen days, during which time no special treatment was given beyond the ordinary rules of dietary and rest in bed for a few days. He made a complete recovery, and was sent to England on a hospital ship."

Lancet, June 3rd, 1899, case reported by H. Whichelo: two fatal cases of lightning:—

"Two brothers, aged respectively twenty-eight and twenty-two years, were driving together in a dogcart during a thunderstorm. They were apparently struck by lightning, and seem to have fallen simultaneously out of the back of the vehicle, for they were found about five minutes after the flash lying side by side on the road, with the seat of the dogcart under their legs and the driving apron over them. I arrived from ten to fifteen minutes afterwards and found them both quite dead; the bodies were lying in the road in the same position as they were found. The elder brother had no external sign of injury. The younger brother presented the following appearances:— The epidermis was burnt over the chest and abdomen from the neck to the pubes, not continuously, but in a number of circular holes from one-sixteenth of an inch to a quarter of an inch in diameter. The metallic collar stud was fused, and the skin beneath was deeply burnt. An odour of burnt flesh pervaded the whole width of the road. The back from the neck to the buttocks was burnt, but less severely than in front. The vest and shirt were charred, but the waistcoat and coat were uninjured. The woollen drawers and trousers had a hole burnt in them about two inches in diameter corresponding to a burn on the right buttock. On the occiput there was a contused scalp wound, evidently due to the fall from the vehicle. There were no other injuries, nor were any of the clothes torn off either of the bodies. Neither urine nor fæces had been voided. There was still no rigor mortis an hour and a half after death. His watch was going, and seems not to have been magnetised, as it has kept good time since. The cloth of the cushion on which the younger brother sat was burnt on its outer surface, but the wooden seat beneath was uninjured. The tailboard of the dogcart has the paint slightly singed immediately behind the younger brother's seat, otherwise the vehicle bears no traces of the lightning. It was very wet from the rain. No one else was in the cart besides the two brothers. The horse was uninjured, and trotted home of its own accord. The road also bore no traces of the lightning."

In 1864, Mackintosh was called to see three persons who had been struck by lightning about *twenty minutes* previously. They had taken shelter under a haystack, which had been set on fire by the same flash. (1) A boy, æt. 10, was then able to walk, although unable to move his legs immediately after the occurrence. All that he remembered was, he saw the stack on fire, and called to his father; he felt dizzy all over, and unable to move. His hair and clothes were not singed, and the metallic buttons on his dress showed no signs of fusion. On removing his clothes a slight odour of singeing was perceptible. He complained of pain at the lower part of the abdomen. There were several red streaks, of about a finger's breadth, running obliquely downwards and inwards on either side of the chest to the middle line in front of the abdomen; they then descended over the pubes, and were lost in the perineum. It does not appear that there was any abrasion of the skin. This boy perfectly recovered; the red streaks gradually disappeared, and could hardly be traced four days after the injury. (2) Another boy, æt. 11, lay prostrate and unconscious,

with an expression of terror and suffering; he frothed at the mouth, moaned piteously, and flung his legs and arms about in all directions. The respiration was deep, slow, and laborious, the heart palpitating, the pulse weak and very irregular; the pupils were dilated, and insensible to light. There were in this case several red streaks converging from the neck and shoulders to the middle of the chest-bone, and passing over the abdomen until they were lost on the pubes. There were similar streaks radiating for a few inches from the tuberosity of the ischium on each hip in different directions until they were lost in the skin. It appears that this boy was in a sitting posture when struck. The hair on the back of his head and neck was singed, and the peculiar odour of singeing was perceived, although his clothes showed no traces of burning, nor the metallic buttons of fusion. The boy became conscious in five hours, and rapidly recovered. The red streaks gradually disappeared, leaving streaks of a scaly glistening white appearance, which ultimately left no trace of their existence. (3) A man, æt. 46, was, like the two others, in a sitting posture, and he appeared to have been killed on the spot; he had not moved. The countenance was placid, and the pupils were widely dilated. The electricity had produced a large *lacerated wound* of the scalp, at the junction of the occipital with the parietal bones, but without causing any fracture. It appeared to have passed down each side of the head, between the soft parts and the cranium. On the left side it had passed downwards in front to the left ear, and terminated at the side of the neck, rupturing bloodvessels and muscles and causing swelling of the parts, with effusion of blood. It presented the appearance of an extensive bruise caused by mechanical violence. On the right side the current had passed down to the space above the collar-bone, causing lividity and swelling of the right ear as well as of the adjacent skin; and it terminated in a dark blue mangled patch of skin, in which there were several free communications with the surface. The hair on the back of the head was slightly singed, and that in front of the chest was singed quite close to the skin, but the hair which covered the wound in the scalp, where the current had entered, was uninjured. The clothes, which were at the time very wet, were neither torn nor burnt, and the metallic buttons were not fused. The hat was not examined. The left side-pocket of the trousers contained several lucifer matches and a tin tobacco-box, which were unaffected. The right pocket contained a knife, which was strongly magnetic. The body was placed in a warm room, and cadaveric rigidity came on in fourteen hours after death (*Lancet*, 1864, 2, p. 118). No post-mortem examination was allowed. It is probable that the brain sustained severe injury. These cases singularly present the effect of lightning in three degrees: the effect of a slight shock in No. 1, of a severe shock in No. 2, and of a fatal shock in No. 3. There was but little bodily injury in either case, and no appearance of burning. The marks on the skin in Nos. 1 and 2 could not have been mistaken for violence, but the wound to the scalp and the injuries to the neck in No. 3 might have been ascribed to the violence of another had not the circumstances been fully known. The clothes probably escaped burning or tearing by reason of their being wet, and thus readily conducting the electric current.

The following exemplifies the severe burns occasionally seen, case non-fatal :—

"A man, æt. 23, while engaged in milking a cow in a wooden shed during a severe thunderstorm, suddenly observed a vivid flash of lightning, which killed the cow instantly, and inflicted severe injuries upon himself. Fisher saw him sixteen hours after the accident, and found a severe burn on his person, extending from the right hip to the shoulder, and covering a large portion of the front and side of the body. His mind was then wandering, and there were symptoms of fever. The man was confined to his bed for seventeen days, and at the end of that time the injuries had not perfectly healed. On examining his dress the right sleeve of his shirt was found burnt to shreds, but there was no material burning of any other part. The case shows that the dress may be burnt without the surface of the body being simultaneously injured; and, further, that a burn may be produced on the body although the clothes covering the part may have escaped combustion. Eight persons were struck by lightning, and on the bodies of some of these there were marks of severe burns. The dresses were in parts much singed. These cases show, in a striking manner, the intense heat evolved in the passage of electricity through the clothes and body. The persons struck were benumbed or paralysed in various degrees, but all ultimately recovered. The burns were so severe that some months elapsed before they were entirely healed" (*Glasgow Med. Jour.*, October, 1859, p. 257).

The following two cases illustrate the severe internal injuries occasionally seen :—

A man was working in the field with several other labourers just after a thunderstorm had passed over and had apparently subsided. He was endeavouring to kindle a light with a flint and steel, when the lightning struck him. For a moment after the shock he stood still, and then fell heavily to the ground, dead. The electricity had entered at the upper part of his forehead, perforating and tearing his hat at that part; it seemed then to have been divided into two currents, which passed down the sides of the body, along the lower limbs and out at the feet. On the upper part of the forehead was found a soft swelling, of a dark blue colour, and about the size of the palm of a hand; the hair which covered it was uninjured. From this spot two dark red streaks proceeded in different directions. One of these passed to the left, running over the temple, in front of the left ear, down the neck to the surface of the chest, over which it passed between the left nipple and the armpit, and so made its way over the body to the left inguinal region, where it formed a large irregular, scorched-looking patch on the skin. From this point the dark red streak again continued its downward course, passing over the great trochanter, then along the outer surface of the left leg to the back of the foot, where it terminated in several small dark blue spots. The other streak, which proceeded from the ecchymosed swelling on the forehead, passed directly to the right ear, which was considerably swollen and of a dark blue colour; from the ear it ran downwards and backwards along the neck, crossed the right border of the scapula, and eventually reached the right groin, where a scorched patch of skin, similar to that in the left groin, was found. From this part the discoloured streak continued down the outer side of the right leg to its termination on the back of the foot, just as on the left side. Although the hair on the forehead, as well as that which occurred in any part of the track taken by the electric current down to the groin, was not burnt, yet at the groin itself, and at every part between this and the foot over which the electric stream had passed, the hairs were completely burnt. The cause of the skin and hair in the groin being burnt is probably to be referred to the buckles of a belt which the man wore round his abdomen at the time of the accident; the belt was completely destroyed. Nothing further worthy of notice was observed on the exterior of the body, with the exception of the face

being very red. The swelling of the head was found to be due to the presence of a large quantity of extravasated blood. The bone beneath was not injured. Blood was effused in other parts of the scalp corresponding to the swollen discoloured patches outside; about four ounces had been effused. The vessels of the cerebral membranes were much congested, and the brain itself contained a large quantity of blood, especially the choroid plexuses. A large quantity of reddish mucus was found in the larynx, windpipe, and air-tubes. The lungs were loaded with dark blood; there was a great deficiency of blood in the cavities of the heart and in the large vessels. The bloodvessels of the stomach and intestines were more than usually congested. The right lobe of the liver was of a dark red colour, and loaded with blood, especially the part which corresponded to the burnt patch of skin at the lower part of the abdomen. The spleen also was large, and filled with blood. Much blood was found accumulated in the substance of the muscles of the abdomen, at those parts which lay beneath the burnt surfaces outside (*Oesterreich. Med. Wochenschr.*, 6th June, 1846).

In the case of an old man killed by lightning, the external surface of the body presented only slight marks of violence, except the left ear, which was severely lacerated. The left hemisphere of the brain was entirely disorganised, forming a homogeneous, almost liquid mass, of a greyish colour, and without a vestige of normal structure, except a small portion of the corpus striatum, which had retained its natural appearance and situation. The left lung was partly injured. The skin of the abdomen was marked by black longitudinal superficial lines. On the skin of the left ankle there was an ecchymosed spot, and in the foot a deep wound. The hat and shoes of the deceased had been destroyed, but the rest of his clothes were uninjured (*Heller's Jour.*, February, 1845, p. 245). A man, æt. 74, while standing under a fir-tree, was struck during a storm and suddenly thrown on his face. He was seen soon afterwards, and was then moaning and quite unconscious; the legs were paralysed, and the arms partially so. His hat, jacket, waistcoat, trousers, and one boot were rent and ripped open. Blood was flowing from a serrated wound over the right temple, from several small wounds over the head and face, and also from the mouth, which was lacerated. There was no ecchymosis or contusion near any of the wounds. He passed a restless night, still moaning; pulse 80, weak, irregular, and intermittent; breathing deep and hurried; and he was unable to speak. The bladder was paralysed. No fracture could be discovered, and the bleeding had ceased. In twenty-seven hours the symptoms had become aggravated; he was very violent, and much ecchymosis appeared around the right eye. The hair on the right side of the head, eyebrows, eyelashes, and whiskers, in some parts, were quite burnt off, and in others scorched, as was also the hair on the trunk, over the pubes, and down the right leg, the cuticle in many cases being completely charred. Some blood oozed from the mouth and nose; the palate was charred and black, the mouth drawn a little to the left side, the tongue dry and brown. He passed another restless night; twitchings of the muscles came on, with facial paralysis; and he died without recovering consciousness, fifty-seven hours after he had been struck. On inspection much blood was found effused between the scalp and skull. A fine fracture, one inch and a quarter long, was found in the squamous portion of the temporal bone, terminating at the suture. There was another fracture at right angles to this, the included portion of bone being black and charred. The temporal bone was forced out, and raised above the level of the other bones. On the dura mater, corresponding to this fracture, there was an effusion of thick blood. The membranes of the brain were torn, and the substance of the brain lacerated. A charred spot was seen on the orbital plate of the frontal bone, through which the electric current had passed (*Lancet*, 1872, 2, p. 77). Even had the facts of this case not been known, and the man had been found dead, the injuries could not have been mistaken for those of homicidal violence. The rent condition of the clothes and the burning and scorching of the hair, with the charring of the wounds and of the bone at the seat of fracture, would have been clear marks of distinction from homicidal violence. The temporal bone was fractured and raised, and not depressed, as it would be from a severe blow, nor was there any distinct mark of a blow on the outside to account for so much internal violence.

The following illustrate the comparative absence of any signs of the cause of death.

For a description of the minor effects of electricity the reader is

referred to the cases of two club servants struck by lightning in London in January, 1885 (*B. M. J.*, 1885, 1, p. 458). Mackay also describes the curious marks he met with on a boy struck by lightning (*Edin. Med. Jour.*, 1883, 2, p. 560).

A case is recorded where a young man at a theatre, out of curiosity, touched two conducting wires from a dynamo-machine. He fell senseless, and died in forty minutes. A sailor on board the Imperial Russian yacht *Livadia* touched the wires of the machine, and was struck dead almost immediately. A gardener was found dead at Hatfield House in the neighbourhood of the conducting wires of a dynamo-machine; and these he was supposed to have touched accidentally. Two men perished in Paris by accidentally coming in contact with some conducting wires whilst climbing a wall. In 1884, a man at the Health Exhibition in London died in a moment from grasping the two wires of a dynamo-machine which he was engaged in cleaning. The appearances met with in the Parisian cases have been recorded ("Ann. d'Hyg.," 1885, t. 13, p. 53), and also those observed on the man killed at the Health Exhibition (*B. M. J.*, 1885, 1, p. 550). In this latter case, on the outer side of the left forefinger was a small elongated blister, about half an inch in length, which had the appearance of a burn; but there was no surrounding congestion of the skin, nor any smell of charred skin. Some of the epidermic cells of the skin raised by the blister appeared as if fused together.

The two following are the latest cases the editor can find, though doubtless many others will occur before this work is published. The inquests are reported in full, for the cases have many interests other than purely medical: accident insurance, precautions against accidents, etc.

On March 15th, 1904, an inquiry was held at Southwark in regard to the death of a boy of fifteen, named Edgar Furlonger, a cleaner in the employ of the London Electric Supply Company, who met with an extraordinary accident on March 4th. At the time of the accident, it appeared, the lad was cleaning a terminal, which he ought not to have touched without orders. When cleaning was necessary the current, which had a power of 10,000 volts, was cut off, and there was no current where deceased was standing, but evidently he tripped, and put his hand on a "live" part. An electrical linesman named Baker saw the current flash out from the terminal in the corner of the room where the boy was, and he ran forward and caught him just as he was about to fall. He was unconscious. Baker at once sent for a doctor, and meanwhile started artificial respiration, with the result that the deceased regained consciousness. On recovering he said, "Hallo! what have I done? What is it?" and then lapsed into a semi-conscious state again.

Dr. Kenneth Black, house surgeon at Guy's Hospital, stated that the lad, who was admitted to the hospital, was severely burned about the limbs. Part of the right arm was dead. He very soon got over the shock of the accident. Witness called in two surgeons, and it was decided to remove three limbs. On the Monday following deceased's right arm was removed, and on the Thursday both legs were amputated. The boy died eight days after admittance to the hospital from heart failure, following on the injuries he had received from the electric shock. It seemed to him incredible that a shock of 10,000 volts should have caused such comparatively slight injuries. The artificial respiration resorted to by Mr. Baker had undoubtedly prolonged deceased's life.

In returning a verdict of accidental death, the jury added a rider to the effect that a guard or guards should, if practicable, in future be put over the terminals.

On March 31st, 1904, Mr. George E. Hilleary held a lengthy inquiry at Stratford touching the death of George Crates, aged twenty-two, of the Portway, West Ham, a switch-board attendant at the Charing Cross and City Electric Light Company's generating station at Pudding Mill Lane, Stratford. Mr. Peter Grain represented

the company, and Messrs. Ramm and Younger were present on behalf of the Board of Trade.

The deceased had been employed by the Charing Cross and City Company for about six months, and was regarded as a capable servant. He had been employed at large stations at Bristol and at Chelmsford. On the 28th inst. he went to work as usual at about 5.30 a.m., and at about eleven o'clock arrangements were made to "shut down" a particular section in order that some repairs might be done. All the sub-stations reported that they had removed their loads, the speed of the engines was brought down, and the voltage meter at the generating station stood at zero. Signals were then given that "all was clear," and Crates proceeded to remove the fuses from the switch-board, which was, according to all indications, dead. He removed six out of nine fuses safely, and was apparently in the act of removing the seventh, when there was a report and a flash, and he fell on to his back with the fuse in his hand. The fuse was not damaged except that its glass was broken by the fall. The deceased had received a shock, and efforts were at once made by his colleagues to restore respiration, but the poor fellow died before the arrival of the medical man who had been sent for.

Dr. S. Alexander said the deceased was scorched on the face, and his hair was singed. He had died from an electric shock. It was difficult to say, the doctor added, how death was caused by electricity, whether it was through the heart or the lungs; but the men in the station in attempting artificial respiration had done the best that could be done.

Mr. Walter H. Kingston, the engineer in charge of the generating station, in reply to Mr. Ramm, said that the current was shut down in order that a cable might be cut off. After this was done he (witness) would have had no hesitation himself in touching the fuses with his bare hands, and the deceased man, with his experience, probably had a similar confidence. Special tongs, with insulated handles, were provided to remove the fuses, whether they were "alive" or "dead." No one would think of touching the fuses when they were "alive"; the tongs were provided for them when "dead" as an extra precaution; but it was known that when the switch-boards were cleaned before the works started each morning the fuses were removed by hand. Everything that could be done to render the fuses "dead" had been done; there was no possibility of connection with the other stations, or between the generator and the cable. The occurrence was inexplicable; it could only be suggested that it arose from a static or capacity charge. In that case, had the man used the special tongs, he would not have received a shock.

Asked to explain how it was that the deceased had removed six fuses successfully and received the shock with the seventh fuse, witness said that possibly the deceased caught hold of the first six by the glass centre, but touched the metal part of the seventh.

The jury returned a verdict of accidental death, and expressed their opinion that the company should see to it that all their rules for the safety of employés should be strongly enforced.

LEGAL RELATIONS OF LIGHTNING AND ELECTRICITY.

The questions of suicide, accident, or homicide, can hardly be imagined in connection with this subject, and yet electricity has, singularly enough, been employed for *suicidal* purposes. In 1885 Paul Thiebault, with this intent, deliberately took hold of the conductors of a dynamo-machine at the works of M. Chertemps in Paris, and was instantaneously killed (*B. M. J.*, 1885, 1, p. 550).

It is quite obvious from what we have stated of the post-mortem appearances that it would be impossible to tell by medical evidence whether a person had been wilfully killed by electricity; it must be decided entirely by circumstantial evidence. One could imagine a murderer possibly persuading his victim to touch dangerous live wires or placing him in such a position that he was exposed to a fatal shock.

With the multiplication of electric trams, accidents are becoming daily more frequent, and in the *Lancet* for February 27th, 1904, will be found an extremely interesting case of an accident fatal to many animals.

The only form of **homicidal death from electricity** which has yet come before the law is that known as electrocution, of which Sir Thos. Stevenson gave the following account in the last edition of this work, to which the editor has nothing to add :—

"In August, 1890, a murderer, Kemmler, was judicially executed by electricity at Auburn, U.S.A., the current being introduced into the body at the shaven scalp. At the necropsy there was a well-defined circle at the top of the head where the skin had been scorched, and a circular spot four inches in circumference on the small of the back where the second electrode had been applied. The body was much burned, and became rigid within an hour of death. On the brain and beneath the spot where the electrodes had been applied the blood was burnt to a carbonaceous mass. The spinal cord, brain, muscles, heart, and abdominal organs were normal" (*B. M. J.*, 1890, 2, p. 354).

When in July, 1891, the reports came to hand about the deaths of the four criminals who were put to death by electricity in the Sing-Song prison at New York, the impression conveyed was that the extinction of life in all the cases was not only painless, but instantaneous, and that a complete success—some said "a triumphant success"—had been achieved. Two of the physicians who had charge of the executions have, however, reported at length on the result of the proceedings, and the facts presented are certainly not at all like those which the earlier accounts led the world to expect. As the *Medical Record* of New York truly says, the proceeding was "experimental," and, it might have added, not very satisfactory even in the form of experiment. In the case of the first criminal, a current of 1.485 volts was applied for twenty-seven seconds, but after an interval of between one and two minutes, signs of life reappearing, the current was applied again for twenty-six and a quarter seconds. In the case of the second criminal, modification of the fatal experiment was tried in order to ascertain whether continuance of the current or sudden impact or breaking of it were more important, and three contacts of ten seconds each were made, followed, when signs of life reappeared, by a contact of nineteen seconds, upon which life was extinct. Continuance of the current was therefore considered important, and to the third criminal three contacts of the current of twenty seconds each were made. These were thought to be unnecessarily long, so in the case of the fourth criminal three contacts of fifteen seconds were applied, with intervals between them of twenty seconds (*Lancet*, 1891, 2, p. 943).

The decision of "homicidal *v.* electrical wounds" hardly requires any further notice than that in the cases already quoted in Sect. VII.

In other possible medico-legal relationships, Dr. Taylor quoted the following :—

A case was tried in France in 1845 in which medical evidence respecting the characters of wounds caused by electricity was of considerable importance. In August of that year some buildings were destroyed at Malaunay, as it was alleged on the one side by a thunderstorm, on the other by a whirlwind, and, as the parties were insured against lightning, they brought an action for recovering the amount insured. The evidence in favour of the accident having been due to electricity consisted first in the alleged carbonised appearance of the leaves of some of the trees and shrubs growing near, and secondly

in the characters of the wounds on the bodies of several persons who were injured at the time of the occurrence. Lesauvage stated at the trial that there was an appearance of dark stains scattered over the bodies, and that those who survived suffered from torpor, pains in the limbs, and a partial paralysis of motion. He observed also that decomposition took place very speedily in the bodies of those who were killed. In one instance the muscles were torn and lacerated, and some small arteries divided. This witness attributed most of the wounds to the effects of electricity. Funel deposed that in some of the dead bodies which he examined the face and neck were bloated and discoloured, as if death had taken place from asphyxia. It does not appear, however, that there were any circumstances decisively proving that the buildings had been destroyed by lightning. Pouillet has given an accurate description of the storm. He believed that, although, as deposed to by some of the witnesses at the trial, it may have been attended with thunder and lightning, the buildings, with the surrounding trees, were overthrown by the mere force of the wind, and not by electricity. The description given bears out this view, but at the same time it is unusual that trees when struck, unless old or dry and withered, should present any marks of combustion about the leaves or trunk. (See *Comp. Rend.*, September, 1845; also *Med. Gaz.*, 36, 1133.) The scientific evidence was of the most conflicting kind. The Royal Court of Rouen decided that the disaster was occasioned by the atmosphere, and, without entering into the various theories of storms, condemned the insurance companies to pay the amount claimed (*Law Times*, March 14th, 1846, p. 490).

SECTION IX.

DEATHS CONNECTED WITH EXTREMES OF TEMPERATURE. SPONTANEOUS COMBUSTION.

We have here to consider deaths from cold and heat, either of which present themselves in two forms, viz., frost-bite or local cold and general exposure to low temperatures, and similarly local burns and general exposure to high temperatures.

A. FROST-BITES.

These effects of local cold belong almost exclusively to clinical surgery, but there is one important medico-legal deduction which may be made from their presence; it is this: a frost-bite is really local gangrene, either from actual freezing of the tissue in extreme cases, or from the cold so constricting the vessels that the tissues die from lack of nourishment. In either case the changes can only occur in tissues which are *living* at the time of exposure, and hence, if local frost-bites are discovered on a dead body, it is conclusive medical proof that the person was living when these local results were produced.

Ears, nose, fingers, and toes are the parts always affected. The affected part is removed by sloughing, and possibly may give rise to identifying scars or deformities (*vide* "Identification").

The editor is not acquainted with any case in which these local lesions have come before a court, though he could conceive of such a case occurring in which compensation might be demanded by a sailor or other workman.

B. GENERAL EXPOSURE TO COLD.

The protracted exposure of this human body to a low temperature may destroy life; and although in this country cases but rarely occur in which cold alone operates fatally, it is not unusual during a severe winter to hear of persons, in a state of poverty and destitution, being found dead in exposed situations. Accidents in mountain climbing are sometimes recorded in which death was due to simple exposure. On these occasions we may reasonably suspect that the want of proper food and nourishment has accelerated death. It is, however, convenient to make a distinction between the effects of cold on the one hand, and starvation on the other, on the system, as the symptoms preceding death and the rapidity with which it takes place are different in the two cases. According to the Registrar-General's return, there were 228 deaths from "gelatio and cold" in 1891, 153 in 1901, together with one case of murder by exposure and one case of manslaughter.

Symptoms of Exposure to Cold.—A moderate degree of cold is well known to have an invigorating effect upon the body; but if the cold be severe, and the exposure to it long continued, while the animal heat is not maintained by warmth of clothing, exercise, or food, the skin becomes pale, and the muscles become gradually stiff and contract with difficulty, especially those of the face and extremities. Sensibility is lost, and a state of torpor ensues, followed by profound sleep, from which the person cannot be readily roused; in this state of lethargy the vital functions gradually cease, and the person finally perishes. Such are the general effects of intense cold upon the body. Its influence on the nervous system is seen in the numbness, torpor, and sleepiness which have been described as consequences of a long exposure to severe cold. Giddiness, dimness of sight, tetanus, and paralysis have in some cases preceded the fatal insensibility. It was observed during the retreat of the French from Moscow that those who were most severely affected by cold often reeled about as if in a state of intoxication; they also complained of giddiness and indistinctness of vision, and sank, under a feeling of lassitude, into a state of lethargic stupor, from which it was found impossible to rouse them. Sometimes the nervous system was at once affected; tetanic convulsions, followed by rigidity of the whole of the voluntary muscles, seized the individual, and he rapidly fell a victim. Symptoms indicative of a disturbance of the functions of the brain and nervous system have also been experienced by Arctic travellers during their residence within the Polar circle.

Under the name of cold stroke, Hartshorne described a case showing the fatal effects of a slight exposure to intense cold suddenly applied to the body. A youth, æt. 14, exposed himself for a few minutes in his night-dress at an open window during a winter's night, the thermometer having fallen 50° F. from the day temperature. He felt thoroughly chilled, and the next day he was suffering from headache, drowsiness, and vomiting; the skin was hot, the pulse hard and quick. On the second day he became restless and delirious, and on the following morning he died. There was no cause for this fatal attack of illness excepting the few minutes' exposure on removing from a warm bed to the piercing wind of a cold winter's night. Other instances are recorded in which persons have become delirious and died from the effects of slight exposure to severe cold (*Amer. Jour. Med. Sci.*, October, 1861, p. 432). Many of the fatal cases registered during a severe winter are owing to this direct effect of cold. A history of the effects of cold and the phenomena connected with this kind of death is given by Hoche in Horn's *Vierteljahrsschr.*, 1868, 2, 44.

Cause of Death.—It has been found that temperature materially affects the amount of oxygen taken by the blood. At a low temperature it takes up less oxygen; hence it becomes less oxygenated, and this state of the blood affects the condition of the nervous system (Bernard, *op. cit.*, p. 114).

As Bunge puts it, the dissociation of oxygen from hæmoglobin is due to chemical processes which require warmth for their performance, and not to the vacuum. At a low temperature the ordinary reducing agents, such as ammonium sulphide, take a much longer time than usual to abstract oxygen from hæmoglobin. Given, then, a diminished capacity of the hæmoglobin to yield up its oxygen and a

coincident lowering of the activity of the tissues as regards their power to utilise it (internal respiration), an explanation is afforded of the gradual and general depression of the systemic powers and also of the occasional manifestations of disturbance of the nerve centres (Mann, "Leg. Med.," p. 233).

Circumstances accelerating Death in Exposure to Cold.—There are certain conditions which may accelerate death from cold. In all cases in which there is exhaustion of the nervous system, as in those who are worn out by disease or fatigue, in the aged and infirm, or, again, in persons who are addicted to the use of intoxicating liquors, the fatal effects of cold are more rapidly manifested than in others who are healthy and temperate. It has been uniformly remarked that whenever the nervous energy is impaired, either by intoxication or exhaustion from fatigue, a man dies quickly from cold. The exposure of drunken persons during a severe winter night may therefore suffice to destroy life, although the cold might not be so intense as to affect others who were temperate. Casualties of this nature sometimes occur during the winter season; and a knowledge of the influence of intoxication in accelerating death under such circumstances may occasionally serve to remove a doubt in the mind of a medical man respecting the real cause. Alcohol is well known to cause a flushing of the skin, and hence a greater loss of heat. Many experiments on soldiers have been made showing the baneful effects of even moderate quantities of alcohol on the powers of withstanding exposure. Infants, especially when newly born, easily perish from exposure to cold. Cold, when accompanied by rain and sleet, appears to have a more powerfully depressing influence than when the air is dry, probably from the effects of evaporation. The following case shows the fatal effects of cold winds accompanied by humidity:—"Of several persons who clung to a wreck two sat on the only part that was not submerged; of the others all were constantly immersed in the sea, and most of them up to their shoulders. Three only perished, two of whom were generally out of the sea, but frequently overwhelmed by the surge, and at other times exposed to heavy showers of sleet and snow and to a high and piercing wind. Of these two one died after four hours' exposure; the second died three hours later, although a strong healthy adult, and inured to cold and hardship; the third that perished was a weakly man. The remaining eleven, who had been more or less completely submerged, were taken from the wreck the next day, after twenty-three hours' exposure, and they recovered. The person among the whole who seemed to have suffered least was a negro. Of the other survivors several were by no means strong men, and most of them had been inured to the warm climate of Carolina."

Post-mortem Appearances.—Opportunities rarely occur of examining bodies when death results purely from exposure to cold. The skin is commonly pallid, and the viscera of the chest and abdomen as well as the brain are congested with blood. Kellie found, in two cases, a redness of the small intestines from the congestion of the capillary vessels, and a great effusion into the ventricles of the brain. A sufficient number of cases have not yet been inspected to enable us to determine how far these two last-mentioned appearances are to be regarded as consequences of death from cold, but all observers

have found a general congestion of the bloodvessels and viscera. In consequence of the great congestion uniformly met with in the vessels and sinews of the brain, some pathologists have regarded death from cold as resulting from an attack of apoplexy; but the symptoms which precede death do not bear out this view. Effusions of blood have not been observed, and a mere fulness of the cerebral vessels after death is not in itself sufficient to justify this opinion. It will be observed that, on the whole, these appearances are remarkably similar to those which are found in death from severe burns and scalds. A man, æt. 57, in a state of intoxication, died from exposure to cold during a severe winter's night. The principal appearances were great congestion of blood in all the cavities of the heart and the large vessels, the blood fluid and of a dark crimson colour, a congested state of all the internal organs, especially of the liver and kidneys, numerous spots or patches of redness on the skin (frost erythema), and the bladder distended with urine (Casper's *Vierteljahrsschr.*, 1865, 2, 140).

The appearance above described cannot be regarded as very characteristic of death from cold, and a medical jurist will perceive that in order to come to a decision whether, on the discovery of a dead body, death has taken place from cold or not, is a task of some difficulty. The season of the year, the place and circumstances under which the body of the deceased is found, together with the absence of all other possible causes of death (such as from violent injuries or internal disease), form the only basis for a safe medical opinion. Death from cold is not to be determined except by negative or presumptive evidence; for there is no organic change, either externally or internally, sufficiently characteristic of it to enable a medical man to give a positive opinion on the subject. The most common and somewhat characteristic appearances met with in death from cold are, however, as follows:—pallor of the surface and erythematous blush on the skin, not on the most dependent parts, and hence not to be mistaken for post-mortem lividity; an unusually florid condition of the blood; and great fulness of all the cavities of the heart.

Dieberg asserts, from his observations in Russia (*Vierteljahrsschr. f. Gerichtl. Med.*, 1883, Bd. 38, s. 1), that in death from cold the heart is always fuller of blood than after any other form of *sudden* death, and the quantity of blood in the cavities averaged nine ounces in his cases. He thinks that excessive fulness of the cavities of the heart is the most characteristic appearance of death from cold.

With reference to the florid condition of the blood, it must be remarked that this is only observed while the body is still at a low temperature; it depends on the retention by the hæmoglobin of its oxygen at this low temperature. Professor Mann regards it as almost characteristic provided that the presence of carbon monoxide can be excluded, which in combination with hæmoglobin produces a similar cherry red colour (*vide* "CO Poisoning").

Mann ("For. Med.," p. 235) says:—"From experimental researches on animals, Falk is disposed to regard a bright red hue of the blood in the heart as a sign of death from cold; it is not produced by exposing dead bodies to the influence of a low temperature, because the atmospheric oxygen cannot diffuse itself so far internally as the heart. In

animals that have died from exposure to a very low temperature which is continued after death, the blood in the heart acquires the same hue as that in the lungs and on the surface; hence, whilst dark-coloured blood in the heart is consistent with death from cold, if bright-coloured it is indicative of it.

"If putrefactive changes have commenced before the body is exposed to a low temperature, the characteristic stains do not appear, because tissues undergoing decomposition are active deoxidisers. Even at the freezing point decomposing tissues take up all the oxygen that is diffused through the skin to the neglect of the hæmoglobin, which thus remains in the condition of reduced hæmoglobin. From this it appears that, although putrefaction in the broad sense is arrested at and below the freezing point, a slow process of oxidation goes on in the parts which are accessible to air *in cadavers in which decomposition has already set in.*"

For the progress of putrefaction in such bodies *vide* "Decomposition," where the influence of cold on putrefaction is fully dealt with.

Medico-Legal relations of Death from Cold.

There is but little on this subject in the annals of crime, though the following old cases show that such do occasionally occur:—

Case of Murder by Cold.—A man and his wife were tried for the murder of their daughter, a girl æt. 11, under the following circumstances:—On December 28th, at a time when the weather was severe, the woman compelled the deceased to get out of her bed and place herself in a vessel of ice-cold water. The child cried and endeavoured to escape from the bath, but she was by violence conpelled to remain in the water. The deceased soon complained of exhaustion and dimness of sight; the prisoner then threw a pail of iced water upon her head, soon after which the child expired. Death was ascribed to the effects of this maltreatment, and the woman was convicted ("Ann. d'Hyg.," 1831, p. 207; see also *Med. Times and Gaz.*, 1860, 2, p. 61).

This case presents a refinement of cruelty rarely met with in the annals of crime. Such a case could only be proved by circumstances; for there would be no appearances in the body, internally or externally, to indicate the mode of death. We learn by this case that the death of infants or children may be caused by the external application of cold liquids to the skin, coupled with exposure. It would also appear from the facts that the brain and nervous system are sympathetically affected through the skin, and not through the introduction of cold air into the lungs. Indeed, it is well known, from the experience of Arctic travellers, that air of a temperature considerably below zero may be breathed without risk, provided the skin is kept warm.

In *Reg.* v. *Lovell* (Gloucester Lent Ass., 1853) a woman was convicted of the manslaughter of a child æt. 4. The child, it seems, was in a diseased condition, and the prisoner, during the month of January, placed her under a pump in the yard and turned the cold water upon her.

The medical witness did not consider that this accelerated death, but the jury returned a verdict of guilty; and on passing sentence Talfourd, J., observed that the verdict was based on common sense and reason, although against the opinion of the medical witness. The editor would remark that this is a typical illustration of bad medical

evidence, probably dictated by bias one way or the other, for it has no support in medical science.

If exposure to degrees of cold which, though in themselves not very low, are so in relation to the resisting power of the individual, be included in this subject, it is not difficult to adduce cases in point.

For instance, at the Bristol Assizes, before Mr. Justice Day, a man and a woman were sentenced to fifteen years and five years respectively for ill-treating a child of eleven by starvation and exposure in a bedroom without fire in winter. The child was insured for 25*l.*, a fact which supplied the motive, and probably influenced the sentence (*Lancet*, 1, 1901, p. 803).

Foundlings, as the very name implies, frequently die from exposure in this way, even when, as in the following case, some care seems to have been taken:—

Dr. Wynn Westcott conducted an inquiry at Shoreditch in reference to the death of Robert Northampton, aged six weeks, who died in the Holborn Union Workhouse on Saturday last.

William Botting, a postman, stated that he found the child lying on a doorstep in Northampton Square, Clerkenwell, about 9.30 on the night of February 19th, and handed it over to the police.

Police-constable New, 260 G, said he found the child well clothed, and provided with a bottle of milk. Inside the clothing was a note, which ran—

"The baby is a month old at the end of next week. Kind friends, take pity on my poor baby. I have three other children, and no husband to keep them. I cannot hurt it, and hope you will get it into a home, where it will be looked after all right."

Detective-sergeant George Wright, G division, stated that the clothing was good, and consisted of a white shirt, white roller, long white night-dress, two white woollen shawls, pink woollen shoes, and flannel hat trimmed with white silk. A part of the clothing was marked in red cotton "A. H. 36," and a piece of tape bearing the number in ink 267 was sewn on.

The Coroner remarked that the red cotton marking was beautifully worked, and the quantity and quality of the clothing did not suggest poverty.

Dr. Thomas Evans, medical officer, stated that death was due to exhaustion. The child was named by the guardians after the square in which it was found.

A verdict of death from natural causes was recorded.

EFFECTS OF HEAT.

A. Local Burns and Scalds.

Varieties of Burns.—*A Burn* is an injury produced by the application of a flame or heated substance (solid or liquid much above the temperature of boiling water) to the surface of the body; while a *scald* results from the application of a liquid at or near its boiling point (such boiling point being approximately that of water) under the same circumstances. There seems to be no real distinction between a burn and a scald as to the effects produced on the body. The injury resulting from boiling mercury or melted lead might receive either appellation. Nevertheless, as a matter of medical evidence, it may be important to state whether the injury found on a body was caused by such a liquid as boiling water, or by a heated solid. If the former, the injury might be ascribed to accident; if the latter, to criminal design. A scald produced by boiling water would be indicated by a sodden state of the skin and flesh, but there would be no destruction of substance. In a burn by a heated solid, the parts may be more or less destroyed, or even charred; the cuticle may be found blackened, dry, almost of a

horny consistency, and presenting a shrivelled appearance. This distinction would only apply to scalds from water. A scald from melted lead could not be distinguished from a burn produced by a solid heated to the same temperature. Some of the oils boil at 500° F., and they produce by contact with the skin burns as severe as those caused by melted metals. Burns from flame, such as that of gas, are indicated by extensive scorching of the skin, while burns from gunpowder are known not only by the scorching, but by the small particles of unburnt carbon which are embedded in the skin. In fact, we may say generally that the temperature to which the body has been exposed (and the extent of surface exposed) is the only point that materially affects results.

Degrees of Burns.—Burns have been elaborately divided into as many as six degrees of severity (Dupuytren). Such elaboration is totally unnecessary, three being quite sufficient, as follows :—

1 *and* 2 *of Dupuytren.*—The heat produces a simple inflammation of the skin without vesication. The skin is red, but the redness disappears on pressure; there is slight and superficial swelling, with severe pain, relieved by the contact of cold substances. The inflammation subsides after a few hours, and the skin resumes its natural condition; or it may continue for several days, and the cuticle then peels off.

There is severe inflammation of the skin, and the cuticle is raised into blisters containing a yellow-coloured serum. This kind of injury is generally the result of the action of boiling liquids. Some blisters are formed *immediately;* others are produced within twenty-four hours, and those which are already formed become enlarged. Suppuration takes place if the cuticle is removed, and the person survives sufficiently long. As the cutis, or true skin, is not destroyed by this degree of burn, there is *no mark or cicatrix left on healing to indicate its past existence,* a reason for combining these two degrees for medico-legal purposes.

3 *and* 4 *of Dupuytren.*—The superficial part of the cutis is destroyed. The burn appears in the form of yellow or brown patches, insensible when gently touched, but giving pain when strongly pressed. An inflammatory redness, accompanied by vesication or blistering, is perceived in the healthy portion of the skin around the eschars. A white and shining cicatrix, without contraction of parts, remains after healing. The degree of injury is commonly observed in burns from gunpowder, and the part which was the seat of the burn is frequently stained black when the particles of gunpowder have not been removed soon after the accident.

The skin is destroyed as far as the subjacent cellular tissue. There are firm and thick eschars (dead portions of skin), which are quite insensible. If the burn has arisen from a boiling liquid, the eschars are soft and of a yellowish colour; if from a red-hot solid, they are firm, hard, and of a brown colour, sometimes black. The skin appears shrivelled and puckered towards the eschar, which is depressed below the surface. The surrounding skin presents a high degree of inflammation, and vesications appear. From the fourth to the sixth day the eschar falls off, leaving an ulcerated surface, which heals slowly, and is always indicated by a cicatrix, from the nature

of which the depth of the burn and also the probable results of the cicatrix may be judged for purposes of medical evidence.

5 and 6 of Dupuytren.—In the fifth degree, the whole of the layers of the skin, the cellular membrane, and a portion of the muscles beneath, are converted into a general eschar. The appearances are similar to those of the fourth degree, but in a more aggravated form.

The burnt part is completely charred. If the person survives, violent inflammation is set up in the subjacent tissues and organs.

Symptoms of Burns and Scalds.—Intense pain is the principal symptom, if indeed not the only one that is primary, for severe pain is in itself quite sufficient to account for the stupor and insensibility, ending in coma and death, which have occasionally been observed to follow severe burns, especially in children; it is also sufficient to account for very rapid death which sometimes follows burns. Should the patient survive the immediate effects of the burning, septic suppuration almost inevitably occurs, either superficially over the affected area, or deeply in the separation of dead fragments of tissue.

Causes of Death in Burns.—The extent of skin involved in a superficial burn, as a result of exposure to flame, is of greater importance than the entire destruction of a small part of the body through an intensely heated solid. When the burn is extensive death may ensue either from the intensity of the pain produced, or from a sympathetic shock to the nervous system. Death rapidly takes place from burns in children and nervous females; but in adults and old persons there is a better chance of recovery. From a statistical report published in 1875 by the Registrar-General it appears that in twenty-five years (1848–72) 68,785 persons died in England and Wales from the effects of burns and scalds. Of this number 34,854 were children under five years of age. In 1891 there were 4,197 deaths from burns, scalds, and explosions. In 1901 there were 2,754. This point is a matter of very great scientific interest, but, as it belongs very much more to the region of clinical surgery, its main outlines only will be here considered. If a person dies either at once or within twenty-four hours the case is fairly simple, and it *may* be so in those which linger some weeks, as when they die from exhaustion of suppuration or from any form of septicæmia; but if they die from perforating ulcer of the duodenum some weeks after the burn, or if they die between say twenty-four hours and four or five days of the burn, the cause of death gives rise to very interesting speculations as to its precise origin.

(*a*) *Suffocation and Poisoning by CO and CO_2.*—When bodies are taken out of burnt-out buildings there is sometimes strong evidence to suggest that death was due to suffocation by crushing from beams of timber, etc., and that they were only burnt after death, and quite as frequently there is strong ground for hope, if not even for actual presumption, that they were first mercifully rendered unconscious by inhaling CO_2 and CO before the very painful death by burning was inflicted, the countenance possibly being quite placid, and the blood either unusually bright red (CO poisoning) or unusually dark (CO_2 poisoning). The presumption is at any rate a pleasant one, and can do no harm.

(*b*) *Shock.*—As remarked above, there can be no doubt that severe pain can kill by shock, such death being instantaneous, or following

within twenty-four hours. This form of death is usually associated with those cases in which either a very large body of flame strikes the face, or a very large surface of the body is burnt.

(*c*) *Suppuration and Exhaustion and Septic Absorption.*—These are self-evident causes of death of a purely clinical interest, and need not detain us long beyond the mention of the acknowledged facts—(1) that burns of any depth beyond very superficial scorching are extremely obstinate to heal; (2) that they are very prone to suppurate freely even with the most careful dressing; and (3) that the raw surfaces offer a very easy mode of ingress for pathogenic micro-organisms of all kinds, including erysipelas, tetanus, etc. (*vide* "Death from Wounds," pp. 388 *et seq.*).

(*d*) *Absorption of Poison applied as a Dressing.*—Many deaths have taken place *after* the application of such dressings as carbolic acid, picric acid, morphia, etc., and possibly some *from* the application, and very many more non-fatal accidents have occurred. (*Vide B. M. J.* and *Lancet*, 1903 and 1904.) The point is of some importance in cases where malpraxis might be alleged against a medical man. It must be remembered that such absorption can, and does in some cases, take place rapidly, and caution should therefore be exercised in the choice of an application to such extensive raw surfaces.

(*e*) *Changes in the Blood due to Heat.*—A full account of the theories regarding this cause of death will be found in Dixon Mann ("For. Med.," p. 244). They may be summed up as follows: that the heat causes such a change in the red corpuscles and blood-plates that the blood can no longer circulate freely, but causes thrombosis in some of the smaller vessels leading to necrosis. In this way it has been proposed to account for the duodenal ulcers which are sometimes found after a burn.

(*f*) *Intercurrent Disorders: Bronchitis, Pneumonia, etc.*—It is probable that these may be induced by aspirating, so to speak, a flame or heated air. Their occurrence otherwise is to be accounted for on ordinary clinical grounds.

Post-mortem Appearances in Burns and Scalds.

Generally.—In examining the body of a person found burnt, all matters connected with sex and identity should be duly observed. The burning of the Ring Theatre at Vienna in 1881 gave rise to many important medico-legal investigations respecting the sex and identity of charred remains, of which Hoffmann and Schutze have given a description (*Wiener Med. Blätter*, 1881, p. 1538), to which the reader is referred. See also Horn's *Vierteljahrsschr.*, October, 1864, p. 303. The presence of a large quantity of phosphate of calcium in the ashes would indicate animal remains; but the bones are never completely destroyed. They become white, and portions of them retain their form under the action of a most intense heat.

Externally.—There is nothing special about the external appearances, with the exception of the actual burnt surfaces, which will be fully considered later under the medico-legal questions. The mere recognition of a burn is a matter of every-day knowledge; but the

important question of ante *v.* post-mortem burns must receive full discussion, *vide infra*.

Internally.—It may be stated at once, that, with the possible exception of (1) the condition of the blood and (2) the presence of ulcers in the duodenum, there are no changes found internally in the body of a person who has died from burns that are in the slightest degree characteristic, or that give the slightest clue to the cause or manner of death. The editor from a very large number of autopsies at the London Hospital is firmly convinced of these views. The engorgement (so called) of lungs and brain, the excess of fluid in serous cavities, occasionally found, are, all of them, phenomena found in all sorts of deaths, and so, too, is a full or empty condition of the heart.

The observations made by Wilks confirm these views. He has found that, in reference to burns, death has been in some cases immediately due to bronchitis, pneumonia, or pleuro-pneumonia. If the patient survive but a short time, the fatal result is put down to shock; if also he lives for a few days, and no marked appearances are found in the viscera, death is attributed to the same cause. He describes a case in which a boy, æt. 2, was scalded on the face, neck, and chest, with hot water, and died in eight days. The body was carefully examined, and no morbid changes could be found to which to attribute death. A girl, æt. 9, died nine days after her clothes had caught fire. Twenty-four hours before death she became very restless, and subsequently all her limbs and body were stiffened as in tetanus. There were no convulsions. There were burns on the upper part of the chest and both arms, with granulating and suppurating sores. The brain appeared quite healthy, also the spinal cord. All the organs throughout the body were healthy (Guy's Hosp. Rep., 1860, p. 146).

The Colour of the Blood.—If this is of a bright red and shows the spectrum of CO hæmoglobin, it is probable that death took place from CO poisoning. In the following case, for instance, this was probably the case, an opinion shared by Dr. Stevenson:—

In the case of six children burnt to death, the following observations were made. The eyelids were firmly closed, the limbs were contracted, and the hands clenched. The burns on the bodies of these children were of great superficial extent, but not deep. Nearly three-fourths of the surface of the body had suffered from the effects of fire, and in all the hands were very much burnt. In one of the bodies least injured by the fire the skin and covering of the chest were injected with bright red blood. The lungs were much congested, and of a bright red colour. The cavities of the heart were empty. The brain was congested with red blood. No blood in the body presented the usual characters of venous blood. Death was attributed to the shock from sudden and extensive burns, and not to suffocation (*Lancet*, 1863, 1, p. 60).

Ulceration of the Alimentary Canal.—In a case tried at the Swansea Lent Assizes, 1869, it was proved that a man had sustained severe burns from an explosion of firedamp in a coal-mine. He partially recovered from the first effects, but lingered for nearly three months, when he died, according to the medical evidence, from inflammation and ulceration of the bowels. There was no other apparent cause for

this inflammation but the burns, and death was referred to the burning as the primary cause. There was no actual recovery from the time of the occurrence until death. In the coal-mining districts, inflammation and ulceration of the bowels is not an unusual result of burns affecting a large surface of skin when the person lingers for some time after the accident.

In a case in which a woman died on the thirteenth day from a superficial burn involving the skin of the lower part of her body, the stomach was found inflamed at its greater extremity, and the duodenum at its lower portion, the mucous folds of the intestines having a scarlet colour. The other intestines as far as the cæcum were also more or less inflamed (*Amer. Jour. Med. Sci.*, January, 1861, p. 137). In this respect, burns of the fourth, fifth, and sixth degrees are especially dangerous to life; and it would be unsafe to give a premature opinion of the probable result, as inflammation of deep-seated viscera only appears after several days.

Curling, in the "Med.-Chir. Trans." for 1842, seems to have been the first to call attention to the occurrence of duodenal ulcers after burns. For many years the editor has been on the look-out at the London Hospital for such cases; he has found one in which there was some pathological appearance in the duodenum in the shape of a superficial erosion, but had never seen an actual ulcer till 1903, when Mr. Rigby kindly showed him a specimen that he had obtained from Poplar Hospital. There was a very definite ulcer, from which fatal hæmorrhage had taken place. There can be no doubt about the occurrence of such ulcers; but to the editor it seems at least an open question whether they can be said to be *post* or *propter* burns. Duodenal ulcers certainly occur without burns, and he is of opinion that there is not sufficient evidence to assert definitely that the ulcer is actually the result of the burns. Even allowing for the changes in the blood and its plates already mentioned, there seems no adequate explanation why thrombosis thus produced should specially occur in the small arteries of the duodenum or other part of the alimentary canal.

An interesting paper on the changes in the blood and nervous system will be found in the *Arch. de Physiol.* for 1898 by Dr. Carlo Parascandolo, abstracted in the *Lancet*, vol. 2, 1898, p. 1216.

The cause of death from extensive burns of the skin and the appearances presented by the internal organs have been investigated and described by Mendel in Horn's *Vierteljahrsschr.*, 1870, 2, 93. See also *Wiener Med. Blätter*, 1881, p. 1538; *Vierteljahrsschr. f. Gerichtl. Med.*, 37, pp. 65, 237.

Medico-Legal Questions concerning Burns.

The principal subject on which medical evidence is required on these occasions is in reference to the question whether, in a dead body found burnt, the burning took place during life or after death. As bodies are sometimes burnt in order to conceal other acts of violence, a careful inspection should be made to determine whether there are indications of any other kind of violence. The power to answer these questions must depend on the degree to which the action of the fire

has been carried. The remains may be so charred as to render all such inquiries nugatory.

In a case of death from burning, the lungs were congested, and the cavities of the heart were empty. No particular observation was made as to the colour of the blood. The tongue was swollen, and there were some other appearances indicative of strangulation, so that the burning had probably been resorted to in order to conceal the mode of death. There was a blister or vesication on the top of the chest, showing that when the body was burnt it retained some degree of vitality. The eyes were much suffused. *Vide* also a case under "Strangulation."

Neither a burn nor a scald appears to be considered as a *wound* in law; but in the statute on wounding they are included among bodily injuries dangerous to life. Burns and scalds may be regarded as dangerous in proportion to the extent of surface of skin which they cover, as well as the depth to which they extend.

Hence we see that the usual questions connected with other forms of violent death may crop up. The following will be here touched upon:—

(*a*) Homicidal and accidental burns and criminal charges in connection with burns and scalds and corrosive fluids.

(*b*) Was the treatment adopted correct—malpraxis?

(*c*) Was the burn inflicted during life or after death?

(*d*) If before death how long did the victim survive?

(*e*) What was the substance that caused the burns?

(*f*) Can wounds unlike burns be produced by fire?

(*a*) **Homicidal and Accidental.**—Accidental burning accounts for a very large proportion of all burns. Ignition of the dress in adults and trying to drink from a kettle of boiling water in children are very common causes of burns and scalds; breaking of cheap lamps, with explosion of the cheaper oils, is another fertile source; workers in molten metal works are often severely burnt; fires in houses and places of entertainment often produce a terrible holocaust of victims. In all these cases there is practically invariably sufficient circumstantial and direct evidence to clear up the origin of the mischief.

In comparison with these accidents direct homicidal burning is rare, but plenty of cases are on record where hot metals, scalding water, and corrosive substances have been used with criminal intent. Thus—

A singular case occurred in which an attempt on life was made by pouring a melted metal into the ear. The mother of an idiot, wishing to get rid of him, adopted the plan of pouring melted pewter into his right ear while he was lying asleep. Great pain and violent inflammation followed, but the man, æt. 25, recovered. The mother then alleged that he had himself poured the melted metal into his own ear. At a judicial investigation, Boys de Loury was required to say whether such an act was likely to occasion death, and, if so, how it happened that the party had in this instance recovered. The alloy was formed of seven parts of tin and three of lead, and the melting point of such an alloy would be about 340° F. De Loury stated that such an act might lead to death by causing inflammation and disease of the bones of the internal ear extending to the brain. The recovery of the youth was owing to the mischief which followed having been comparatively slight. In performing some experiments on the dead body, he found that it was difficult to fill the ear-passage with such an alloy in consequence of the sudden expansion of the air caused by the high temperature ("Ann. d'Hyg.," 1847, 2, 424).

A woman was convicted of throwing boiling water over her husband, with intent to maim him (*Reg.* v. *King*, Liverpool Sum. Ass., 1847). In another case (*Reg.* v. *Blewitt*, Worcester Sum. Ass., 1847), the prisoner was convicted of the manslaughter of his wife by pouring over her the contents of a kettle of boiling water. At the Stafford Winter Assizes, 1859 (*Reg.* v. *Hill*), a man was convicted of feloniously casting boiling water over the prosecutor, with intent to do him grievous bodily harm. The medical evidence was to the effect that the scalds were on the head, cheek, neck, and arm, and were of a dangerous character. A woman at Glasgow attempted to kill her husband by pouring boiling water over his genital organs while he was asleep in bed. He died, but his death could not be clearly traced to the scalding.

At the Munster Assizes in December, 1903, Michael Leahy, a labourer, of Tipperary, was tried for the murder of his infant daughter. The evidence showed that, while in a drunken fury, the prisoner poured boiling water on the child. The jury found prisoner guilty of manslaughter, and he was sentenced to three years' penal servitude. Chief Justice O'Brien said that if prisoner had been in England he would have been convicted on the capital charge.

The crime of **throwing mineral acids, alkalies, or other corrosive liquids** on the person was at one time prevalent, and until the passing of 24 & 25 Vict. c. 100, s. 29, there was no adequate punishment for it. On one occasion an assailant escaped a charge of felony because it could not be considered in law that sulphuric acid was capable of producing a *wound*, the man having been indicted for wounding. One surgeon considered that the injury produced was a wound; another thought that it was not. The judges decided that it was not a wound within the meaning of the Act (*Rex* v. *Murrow*, Liverpool Aut. Ass., 1835). The statute above mentioned, while it punishes the offence, omits all reference to a definition of the word wound. The nature of the liquid thrown is merely defined, in general terms, to be "any corrosive fluid or any destructive substance"—a point which will require medical evidence for its elucidation.

In common language, and according to the statute, the injury thus produced by a mineral acid such as oil of vitriol is called a burn; but it is different in its origin, as well as in its progress. Great deformity and actual blindness have resulted from such an injury. The period at which a person may recover from an injury of this kind depends on the degree and extent of the injury and the part affected by the corrosive liquid. Although a person may not die from the direct effects of the acid, yet the inflammation which follows may prove fatal. In infants or delicate women an extensive injury thus produced may readily destroy life. In one instance, sulphuric acid thrown on the face produced inflammation of the eye, for which bleeding was prescribed. The person died of phlebitis (inflammation of the vein) as the result of this bleeding ("Malpraxis"). In the case of Miss Cashin, for whom an escharotic liniment, containing nitric acid, was prescribed by a quack, there was no doubt that death was caused by the great local mischief produced by the application. Sulphuric acid is most commonly used; nitric acid has also been thrown at the person, and has led to the destruction of the sight. The caustic alkalies may also be used under these circumstances, as well as numerous other liquids, on which the only medical opinion required would be whether the article employed should or should not be considered as a corrosive liquid or a destructive substance. To constitute a felony, it is not now necessary that the *person* should have sustained from the act of

throwing any bodily injury. Unless vital reaction has taken place, there are no means of distinguishing the effects of a corrosive liquid on the living from those produced on the dead body ("Ann. d'Hyg.," 1869, 1, 396).

The mineral acids are sometimes used in other ways for the destruction of life. In 1833, a man poured a quantity of strong nitric acid into the ear of his wife while she was lying asleep. She awoke suddenly with a violent pain in the ear, which continued for three days, whereby she became weak and exhausted. Soon afterwards there was copious bleeding, and a portion of membrane escaped. She lost the use of her right arm, and became completely deaf. Suppuration took place from the ear, and blood escaped daily. She gradually sank, and died six weeks after the injury, the right half of the body being convulsed before death. On inspection a portion of the external ear was wanting, and the ear-passage was much wider than natural. The brain near the petrous portion of the temporal bone was softened, and the bone itself diseased (carious). The injury had led to death indirectly by producing disease of the brain (*Med. Gaz.*, vol. 17, p. 89).

In a case at Aberdeen, a woman poured oil of vitriol down the throat of her husband while he was asleep with his mouth open. She was convicted of the murder. In another case, a woman killed her husband by pouring a solution of corrosive sublimate down his throat while he was sleeping. In *Reg.* v. *Lipski* (C. C. C., July, 1889), a murder was committed by pouring a mixture of nitric and sulphuric acids down the throat of a woman in bed. These, however, were treated as cases of poisoning, as death did not depend on the local or *external* mischief produced by the corrosive agent employed.

It is rare that murder is perpetrated by burning; the dead body is either burnt for the purpose of entirely destroying it, or the clothes are fired soon after a person has been killed, in order to conceal wounds or other violent means of death, and to make it appear as if the deceased had been accidentally destroyed by fire. Death by burning is either the result of accident or homicide, most commonly the former, but medical evidence may give rise to a suspicion of murder under two conditions: (1) when it is evident that several parts of the body have been fired at the same time, and the burns are such as not readily to be explained by the same accident, or by an accidental ignition of the clothes; (2) when there are marks of homicidal violence on the body, but these marks, if we except fractures of the bones, may be easily effaced when the burn is extensive. In investigating a suspicious case, we must remember that the fact of a dead body not being found near a fire or any substance capable of causing ignition does not justify an imputation of murder, since the deceased, unless disabled by intoxication, infirmity, or disease, has the power of running away from the fire after an accident, and may be found dead at a distance without having been seen by any person. Homicidal burning cannot be established by medical evidence so much as by that which is presumptive or circumstantial; but there are many medical questions which arise out of the circumstances under which a dead body is found burnt.

Of deliberate suicide from burns the editor is unable to find a more

recent case recorded, though it is a quite conceivable method for a lunatic to adopt.

Dr. Taylor remarks that—

> A case of this kind occurred in the gaol of Newgate in 1871. A prisoner was found in his cell with his clothes and part of the bedclothes much burnt, and with some severe burns on his body. The gaslight in the cell was so placed that no accident would account for the fire; but all the facts concurred to show that the man had done the act deliberately. He gave no alarm, but a moaning was heard in his cell, and this caused the warder to enter and make the discovery in time to save him.

(*b*) **Was the Treatment Correct?—Malpraxis.**—If, under these circumstances, opium has been given to the patient as a sedative, the stupor resulting from a burn may be attributed to the effects of the drug; and should the person die, the practitioner may find himself involved in a charge of malpraxis. It may be alleged, as in the following case, that the person was poisoned by opium. A medical man was charged with the manslaughter of a child by giving to it an overdose of opium while it was labouring under the effects of a severe scald. Abernethy stated in his evidence, which was given in favour of the practitioner, that he thought the exhibition of opium very proper, that the quantity given, eight drops of tincture of opium immediately after the accident and ten drops two hours afterwards, was not an overdose for a child (the age is not stated). The circumstance of the child continuing to sleep until it died, after the exhibition of the opium, was, in his judgment, no proof that it had been poisoned. The sleep was nothing more than the torpor into which it had been plunged by the accident. The surgeon was acquitted. Notwithstanding the very favourable opinion expressed of this plan of treatment, it would be advisable to avoid the use of opium on these occasions in respect to infants and children. Life is readily destroyed in young subjects by the smallest dose of this drug (see "Poisoning by Opium"), and there are no sure means of distinguishing the comatose symptoms produced by a burn or a scald from those produced by an overdose of opium. A similar caution might be given as to dusting the surface of a burn with starch and morphia; a very small quantity of morphia must be mixed with the starch.

As already mentioned in connection with the cause of death, carbolic acid, owing to its analgesic action, was very freely used as a dressing for burns. The editor has seen several cases of carboluria thus produced, and in case of death the propriety of the treatment might be called in question. To picric acid the same remarks might apply. To boracic acid baths, and to alcohol (which has been suggested), and to carron oil no such objection is likely to arise.

Direct criminal charges of malpraxis from the use of any of the above can, however, but rarely arise, but in the civil courts in actions for recovery of fees such allegations might be urged in defence. It is well, therefore, that medical men should be on their guard.

(*c*) **Was the Burn inflicted during Life or after Death?**—After a murder has been perpetrated it is not uncommon for a criminal to attempt to dispose of the body by burning it (*Reg.* v. *Lee*, Exeter Ass., January, 1885, and others). It is, therefore, very important for the medical jurist to be acquainted with the differences between a burn

inflicted during life and a burn on a body already dead. In general the body is not burnt until all signs of life have disappeared; we shall therefore meet in such cases with nothing but the charring of dead flesh, so that no difficulty can exist in forming an opinion. When the burning is partial, and has probably taken place from a wilful ignition of the clothes at or about the time of death, some caution is required in expressing an opinion. The principal points naturally turn on the signs of reaction which still living tissues show toward burns. These are the production of vesicles and signs of congestion or inflammation (*vide* also "Signs of Death").

Vesication.—The production of *vesication—i.e.*, of *blisters containing serum*—is commonly regarded as an essential character of a burn which has been produced during life, but it is not a necessary or invariable effect of a burn on the living body. Vesication is especially observed in scalds, or in those cases in which the skin has been burnt by flame or by the ignition of the clothes, provided the cuticle has not been destroyed. It is not so commonly observed in burns produced by intensely heated solids. In vesication the cuticle is raised from the true skin beneath, and is converted into one or more blisters containing serum, while the skin around is of a deep red colour. It is uncertain as to the time at which it appears; it may be produced in a *few minutes*, or sometimes not for several hours; hence death may take place before vesication occurs, and the non-discovery of this condition does not warrant the opinion that the burn could not have taken place during life. If the cuticle is removed from a vesicated part of the living body, the skin beneath will become intensely reddened, but if the cuticle is stripped off a dead body the skin will become hard, dry, and of a horny-yellow colour; it does not acquire the intense scarlet injection which is acquired by the living skin when vesicated and exposed.

There have been conflicting opinions whether the presence of blisters on a dead body should be received as absolute proof of burning during life. The following may be taken as a summary of the ascertained facts. Christison had an opportunity of trying experiments on the effects of dry heat on the same body before and after death in the case of a young man who had poisoned himself with opium. While he was lying in a hopeless state of coma, four hours before death, a hot iron was held on the outside of the hip joint; and half an hour after death a red-hot poker was applied to three places on the inside of the arm. Vesication followed the burns in both instances, but those caused during life contained serum, and those which were formed after death *air*. In a second experiment a cauterising iron produced no blisters on a leg half an hour after amputation, but vesications containing air were formed when the iron was applied ten minutes after amputation. On the whole Christison thought that a vesication containing serum indicates a burn during life, and one containing air a burn after death. The author performed some experiments on the bodies of infants eighteen and twenty hours after death both with boiling water and heated solids, but in no case did he observe any kind of vesication to follow at that period. The skin was shrivelled, and was partly destroyed by the heat, but there were no blisters produced. (See "Ann. d'Hyg.," 1843, 1, 383.) In certain morbid states,

blisters containing serum may be produced in the dead body even twenty-four hours after death. Leuret observed that this took place in a dropsical subject in the vicinity of which a heated brazier had been placed. The cuticle was hardened, then raised and blistered, and the blister contained an abundance of reddish-coloured serum. In repeating this experiment on other dead bodies not infiltrated it was observed that no vesications containing serum were produced ("Ann. d'Hyg.," 1835, 2, 387). Champouillon finds that blisters may be produced in bodies affected with general dropsy at almost any period after death. The blisters did not appear immediately; the time which he found requisite for their production varied from two to six hours. The serum effused beneath the raised cuticle was rarely tinged with blood ("Ann. d'Hyg.," 1846, 1, 421). The conclusion to be drawn from these experiments is that, in the examination of *burns* on the body of a person affected with general dropsy, it is necessary to be cautious in expressing an opinion. In such cases it would not be possible, from the existence of mere vesication, to say whether the burn took place before or after death.

Wright produced a serous blister in a dead body more than a dozen times, twice within half an hour and once within fifteen minutes after death; and in amputated limbs he has produced them in from half a minute to four minutes and a half after amputation. The only favourable opportunity which occurred to him for producing a serous blister after death was in the case of a woman thirty years of age, who died suffocated from acute congestion of the lungs. She was slightly dropsical. *Three hours and a half* after death, when the body was quite warm, and the joints flexible, a spirit-lamp flame was applied to the lower and back parts of the left leg. After the lapse of an hour blisters had formed, and were filled with serum of a pale straw colour; one contained two and the other three drachms of fluid. Ten and fifteen hours after death, when the body had become cold and rigid, the flame produced only *gaseous* blisters ("Path. Researches on Vital and Post-mortem Burning," 1850). The results obtained by Liman in performing similar experiments on five dead bodies in from one to two hours after death are not in accordance with those described by Wright. Liman noticed that by a spirit flame a blister might be raised, but that it contained nothing more than vapour derived from the fluids of the skin beneath the cuticle. It soon became flat and charred, and there were no changes in the surrounding skin indicative of vital reaction. The temperature (of the bodies) varied from 78° F. to 98° F. No experiments were performed on the bodies of persons dying or just dead (Casper's *Vierteljahrsschr.*, 1863, 24, 367). It is, therefore, exceedingly doubtful whether, except under special conditions of the body such as general dropsy, blisters containing serum can be produced by a burn on the skin of a person really dead. Christison found that when boiling water was poured upon a dead body *ten minutes* after death the skin was simply ruffled and shrivelled, but the cuticle was not raised into a blister. The same effects were produced so long as the body retained its warmth. Accident enabled the author to describe the results within a shorter period than that above mentioned. The body of a drowned man within a few minutes after the accident was removed from the water and placed in a hot bath. It was found

impossible to resuscitate him; but, owing to the heat of the water, portions of the cuticle came off when the body was removed. On inspection there were several blisters *filled with bloody serum* over a considerable portion of the skin, especially of the extremities. There was no dropsy here to account for their production, and the fact of their occurrence appears to bear out the view of Wright that the production of a *serous* blister on a dead body depends on the amount of organic life remaining in the tissues. In this case the man was pulseless, and to all appearances *dead* when placed in the hot bath; hence the effects of *hot liquids* on the living and the recently dead body, so far as the production of vesication is concerned, are proved by this case to be similar. Chambert has published the results of numerous experiments on the effects of burns on the living and dead body. These were made on the bodies of persons from the moment of death until twenty hours after dissolution, and some were performed before death. The general results of his researches are—that blisters may be produced by burns both on the living and dead bodies; that they are produced at a lower temperature in the living than in the dead; that in the living a burn produces great capillary congestion, with effusion of serum in the blisters, and that this serum, when heated or treated with nitric acid, sets into a nearly solid coagulum. The blisters produced in a dead body, even a few minutes after death, contained a thin watery serum, which was only rendered opaline or milky by heat or nitric acid, *i.e.*, contained but very little albumen compared with the fluid obtained from the blister of a burn during life.

Signs of Congestion.—In burns, especially in those produced by red-hot solids, other effects besides vesication follow. The edge of the skin immediately around the burnt part is commonly of a dead white line, and close to this is a *deep red line*, gradually shaded off into the surrounding skin, which is reddened. The diffused redness is removable by pressure, and disappears with life; the red line here referred to, however, is not removable by pressure, and is persistent after death. This line of redness is not always met with in severe burns, and when a person survives one or two days, its production appears to depend upon a power of reaction in the system. Thus, then, its absence furnishes no proof of the burn having been produced after death, for it is not a necessary accompaniment of a burn during life. Christison endeavoured to determine by experiment whether this line of redness could be produced by applying a heated iron to a dead body. He found that when the person had been dead only *ten minutes* no such effect was produced. In repeating his experiments on bodies many hours after death, the author found that no line of redness ever presented itself; so that its discovery in a dead body burnt would appear to indicate either that the burning took place during life, or within a few minutes after death, most probably the former. Champouillon takes exception to the inference derivable from these experiments. He says that he has caused the production of a line of redness by the application of heat to a dead body, and that it is a uniform accompaniment of the formation of blisters in the dead. He admits that it is in this case a mere capillary infiltration of blood, quite superficial, and surrounding the margin of the blister; while in the red line produced during life the tissues of the skin are deeply injected, and this line is evidently the

result of vital reaction. (See "Ann. d'Hyg.," vol. 1, p. 442.) It would appear that he has only remarked this condition in dead dropsical bodies in which vesication had been produced, and it is obvious from his description that he is referring to a slight congestion of the vessels, occasioned probably by the stagnation of the fluid portion of the blood in the superficial capillaries. It is altogether distinct from the line of redness described by Christison as a frequent consequence of severe burns. In the case of Mr. Westwood in 1839, the fact of certain burns on the body having been produced during life was determined from an observation of this sign. The deceased was found dead with his skull extensively fractured, his throat cut, and his body burnt in various places. French remarked that the burns were surrounded by a line of redness; that they were probably produced about the same time as the other injuries, but certainly while there was some vital action in the system. When, however, vesication and a line of redness are absent, we have no medical data on which to found an opinion whether the burn was caused before or after death. Wright considered that in a low state of vitality a line of redness might not be produced by a severe burn on the living body, and that more reliance might be placed on the red marks found beneath the blisters and crusts of vital burns. These latter were well marked when he found the line of redness itself indistinct. The researches of Chambert confirm this view. In a burn on a living person, if the skin has not been entirely charred and destroyed, the cutis will present a dotted or pointed redness, these dots or points corresponding to the sudiparous (perspiratory) glands and hair-follicles. After complete death, the burn does not produce any such effect; the cutis is of a dead white on its surface and in its substance. In one experiment performed ten minutes after death, there was no redness of the skin either beneath the blisters or in the surrounding parts ("Ann. d'Hyg.," 1859, 1, 368). This reddened or congested state of the bare skin is more constant than any other appearance, and forms at present the best criterion of the infliction of a burn on the living body. These facts connected with burns on the living and the dead underwent a minute scrutiny in a remarkable case of alleged matricide at Bridgnorth (*Reg.* v. *Newton*, Shrewsbury Lent and Sum. Ass., 1849).

It seems probable to the editor that this red line which he has constantly and invariably noted in the post-mortem room at the London Hospital owes its appearance to those changes in the blood which have already been more than once referred to, coupled with something of the nature of a fixation of the albumen of the corpuscles by heat. Though there is no sharp line of demarcation between them, it is important to note that this red line is not quite the same thing as the inflammation which occurs at the edges and on the surface of a burn when the victim survives for some time; the degree and the stage of this inflammatory reaction is of importance in answering the next question.

(*d*) **How long did the Victim survive the Burns?**—When *several burns* are found on a dead body, it may be a question whether they were all produced at the same time. This is a point which can be determined only by observing whether any of them present signs of gangrenous separation, of suppuration, granulation, or other changes that take place in a living body after accidents of this kind. The

witness may be asked, How long did the deceased survive the burn? A person may die in a few minutes or live some hours after receiving a most extensive burn, and yet there will be no change in the part burnt to indicate when death actually took place. There may have been no time for inflammation or its consequences to become established. Suppuration generally follows vesication, and in severe cases it may occur on the second or third day, but often not until a later period. In regard to gangrene, this takes place when the vitality of a part burned is destroyed. The time of its occurrence is uncertain, but it sometimes very speedily follows the accident.

All that can definitely be said is this : inflammation can only occur in *living* tissues ; therefore, if it is present, the patient survived long enough for reaction to set in. The stages of inflammation are notoriously variable in the rapidity with which they appear or follow one another, and therefore a very guarded opinion must be expressed as to the exact duration of life after burning; only the most elastic estimates can be accepted as evidence.

The conclusions which we may draw from the foregoing statements are—(1) that, as a general rule, when we discover marks of vesication, with effusion of serum or a line of redness, or both, about a burnt part of the body, we are justified in saying that the burn has occurred during life; (2) that when these appearances are not met with it by no means follows that the burn has not been produced in the living body, the affirmative evidence derived from such appearances being much stronger than the negative.

(*e*) **What was the Nature of the Substance that caused the Burns?**—Amongst the questions which have arisen in reference to a body found dead from burns is this : whether the burns have been caused by gas, by inflammable vapours such as petroleum, or by gunpowder. Petroleum is at once indicated by the peculiar and powerful odour, and sooty blackening of the parts. In *Reg.* v. *Gaitskell* (Carlisle Spring Ass., 1872) the prisoner was convicted of manslaughter under the following circumstances. He poured a quantity of petroleum over the clothes of the deceased, and by accident the vapour caught fire, and the burns produced caused the man's death on the following day. Burns from the flame of gunpowder are generally characterised by the blackening of the skin and the introduction of some of the grains into the substance of the skin. In the Morfa colliery explosion in 1870, it was of some importance to determine whether gunpowder or firedamp had caused the death of some colliers. There was a little difficulty in the case because explosions from gas in mines generally cause a blackening of the skin from the coal dust. The large volume of flame both in gas and gunpowder explosions causes extensive and fatal burns.

It is quite obvious that from the burn itself caused by a *flame* but little evidence is likely to be obtainable, the only condition being a sufficient temperature to cause the burns.

The recognition of a scald from water presents very little difficulty, and even the scar of such an accident is usually characteristic (*vide* "Scars," p. 147).

When some corrosive has been thrown at a person and reached either the skin or clothes, medical evidence of the nature of the

liquid thrown is of very great importance, because the *attempt* to so injure is a crime, and if success be not attained it is only medical evidence that can clear up the case. The colour of the injured part may help. Thus sulphuric acid has a tendency to char tissues, and so may leave a dark or even black mark; nitric acid produces yellow stains on the skin, and hydrochloric stains it whitish or grey. On the dress nitric acid frequently makes a yellowish red stain, the other two acids leaving a brownish one or no stain at all. Caustic alkalies produce a soapy feel on either skin or dress. If enough of the fluid still remains on the skin or dress to admit of extraction and analysis, such should be made (*vide* appropriate place under "Poisoning"), but naturally this is rarely the case, as efforts are usually at once made to get rid of the fluid. It is very rare for the destroyed part of skin to be hard, as in a burn from flame; it is usually soft and necrosed.

(*f*) **Can Wounds be produced by Fire?**—On the discovery of wounds on a body which has been exposed to fire it is necessary they should be closely examined in order that a witness may be enabled to say whether they have been caused by cutting or other instruments *before* death by burning or whether they are not simple mechanical results of the effects of fire on the skin. A boy, two years of age, was brought to the London Hospital in 1840 so severely burnt on the face, neck, abdomen, and limbs that he survived the accident only three-quarters of an hour. It appeared that the stepmother, who had charge of the child, left him at home locked up in a room where there was a fire while she went out. Some of the neighbours shortly afterwards, hearing screams proceeding from the room, broke open the door and discovered the child enveloped in flames and its clothes on fire. The flames were immediately extinguished, and the boy was brought to the hospital. A suspicion of ill-treatment having been excited by the appearance of wounds about the knees, which were observed as soon as the child was admitted, and by the reported neglect and ill-usage of the child by the stepmother, an inspection was made. The body was plump and well formed. The skin in the burnt parts was deprived of cuticle and converted into a dry deep yellowish or blackish mass, which was very tense, hard, and easily torn. There were gaping wounds on both knees. On the right side a fissure in the skin commenced about the middle of the thigh and proceeded for two inches and three-quarters to the inside of the kneepan, where it became somewhat jagged, and making a sudden turn inwards, passed to the extent of two inches towards the back of the joint. A transverse laceration of the skin, three-quarters of an inch in length, was observed on the front of the left thigh a little above the left knee, and another, which was also transverse and measured an inch and a half in length, was situated below on the inner side of the joint. These fissures in the charred skin were all about three lines in width and two in depth, and exposed the fatty tissue beneath, which was white, and free from any effusion of blood. The edges of these fissures were not uneven, but they did not present the clean and smooth appearance usually observed in incised wounds. The vessels on the surface of the brain were full of blood, and the cortical structure appeared dark-coloured. The lungs were congested, but the heart contained little blood. The mucous membrane of the stomach presented a slightly pinkish hue, but that of the

intestinal canal was nearly white. From the absence of any trace of effusion of blood, the sound condition of the exposed adipose tissue, its exemption from the action of the fire, and the irregular character and appearance of the fissures, Curling concluded that they were not the result of wounds inflicted before the occurrence of the burn; he considered them to have been occasioned by the influence of heat, which had forcibly corrugated the skin and completely destroyed its elasticity, and the superficial layer of fatty tissue, being closely adherent to it, necessarily gave way at the same time. In several places some small vessels containing blood were observed running across the fissures; these, being more tenacious than the fatty tissue, had not yielded with it. This appearance alone was sufficient to negative the supposition of the infliction of wounds by cutting instruments. The production of the fissures might have been aided by the child's struggles immediately after the occurrence of the burn, but it did not appear that these were at all violent. This conclusion was justified by the facts, and the case is calculated to throw an important light on the accidental origin of fissures or wounds of the skin in cases of death from burns.

Illustrative Cases.

The following cases are illustrative of some of the various points raised:—

Burns before or after Death.—In 1848 two persons were charged with the murder of a new-born child, which had been secretly buried and was exhumed for inspection ten days after death. Independently of an incised wound on the arm, the edges of which were everted and retracted like a wound produced on the living body, the right leg presented the marks of burning. The cuticle was entirely destroyed over the greater part of the limb; the surface beneath had an intense scarlet colour, and was much injected. There was a red line of inflammation around its edge, particularly in the upper portion, and at the lower part of the scrotum there was a large vesicle filled with serum. From this condition of the parts Prince properly inferred that the child must have been living when these burns were inflicted. The lungs merely indicated that respiration had been imperfectly performed. It turned out subsequently, by the confession of the mother, that the child had been born alive, and that its body had been deliberately burnt by one of the accused parties. The child probably did not survive its birth a quarter of an hour, a proof that the marks indicative of a vital burn do not require a long period for their production.

In *Reg.* v. *Taylor* (York Lent Ass., 1842) the deceased was found dead with marks of strangulation on her neck, and her clothes were much burnt from her waist to the knees. She was lying across the hearth; the body was burnt, as well as the upper and lower limbs and the neck. In the opinion of the medical witness, the burn on the neck could not have been produced by fire extending from the other parts of the body. The burns must have occurred after death, and they could not have taken place before nor at the time of death, because there was no vesication, and he had never seen a burn on a living person which was not followed by blistering. The prisoner was convicted, his counsel having failed to prove or render it probable that death was caused, as alleged, by accidental burning. (See report by Stone of the trial of Dr. Webster for the murder of Dr. Parkman, Boston, 1850.)

Difficult Case of Accident or Homicide.—A man named Gilchrist was tried at Glasgow for the murder of his wife. On the evening of the alleged murder the persons who lived on the floor above the couple stated that they heard a noise like that of two persons struggling, and afterwards a moaning as of one choking or bleeding to death. A smell of fire now became perceptible in the house, which was soon filled with smoke. The witnesses, being alarmed, went down to the prisoner's apartment and demanded admission. After some delay he admitted them, and in doing so appeared to them to have come out of an inner room, where he said he

had been sleeping. On admitting them he stumbled over the body of his wife, which was lying in the outer apartment quite dead, kneeling before a chair, and very much burnt. The prisoner was accused of having murdered her and then burnt the body in order to conceal the manner of death. In his defence he alleged that he had gone to bed tired, and that he knew nothing of what had happened to his wife until awoke by his neighbours. He presumed that her clothes had caught fire while she was intoxicated, and that she was thus accidentally burnt. The medical witnesses who examined the body reported that they found it so much burnt that they could give no opinion of the cause of death. The prisoner was condemned, the general evidence being against him, although the precise manner of his wife's death was not proved even presumptively.

In another case the general evidence was similar to that adduced in the case of Gilchrist, but stronger against the prisoner. On the night of the alleged murder the prisoner was in bed, when his wife returned home with a lighted candle and some whisky, which she had procured from a neighbour. Some time after a struggling was heard in the apartment, and when this had subsided a smell of fire was perceived to issue from it. The neighbours now endeavoured to obtain admission by knocking at the prisoner's door, but he either could not or would not hear them. At last a man forced his way in by breaking the window of the outer room. On entering he found the room full of smoke and something burning in a corner, over which he instantly threw a pitcher of water; this proved to be the body of the deceased. Several persons now entered the inner room, where they found the prisoner either asleep or feigning to be so. On being roused and told that his wife was dead he expressed neither surprise nor sorrow, but coolly demanded by what authority his neighbours had broken into his house, and threatened to send for a constable. On an examination of the body some parts were found completely carbonised by the action of the fire. On the face and extremities, however, the fire had not acted with such violence, and on these parts were found marks of vital reaction, indicating that the burning had taken place during life. Some spots were merely red and inflamed, others scorched to a hard transparent crust, but surrounded by a distinct redness; there were also many vesications filled with serum. From these appearances the witnesses gave it as their opinion that the deceased had been burnt to death. The jury, in this case, returned a verdict of not proven, considering probably that the deceased might have been accidentally burnt.

Duncan remarks, in regard to these two cases, that the action of the fire was extremely violent and destructive compared with the small quantity of combustible matter consumed, but by what standard this was measured we have no knowledge. As the combustible material was reduced to ashes, and the time occupied in the burning was not known, such an opinion could be little more than a conjecture. In both the burns must have been entirely produced by the ignition of the clothes, since there was no trace of burning of the house or furniture in either. In the second case the deceased was found on the hearth with part of her clothes unburnt and a chair from which she had fallen quite entire. She was dead when the neighbours entered, and the body was discovered in the dark by the red light issuing from it. An important question was raised on the second trial in reference to the opinion of the deceased having been burnt to death, namely, whether the redness and blisters remarked on the edges of the scorched parts might not have arisen immediately after strangling or some other cause of death than burning during the period when a lingering vitality remains in the body, and when undoubtedly certain phenomena of a vital nature are frequently observed. The medical witnesses felt themselves unable to answer the question decisively, but they stated that they did not consider it at all probable that blisters could be produced on the body even immediately after death (*Med. Gaz.*, vol. 8, p. 107; see "Ann. d'Hyg.," 1835, 2, 370).

(*a*) *Cases of "Vitriol-throwing."*—At Leeds Assizes, March, 1904, Lavinia Coulson, twenty-five, was charged with throwing vitriol upon a domestic servant named Kenefick, who had in consequence lost the sight of both eyes.

Prosecutrix was housemaid to Mr. Carter, veterinary surgeon, Keighley, with whom prisoner's husband was employed. Prisoner became jealous of the girl, and, after remonstrating with her several times, went to a chemist's shop and purchased a quantity of vitriol. She also visited a farmer's wife named Dixon and borrowed a suit of men's clothes, which she said she wanted to wear in order to watch her husband. Dressed in these clothes, she went to Dr. Carter's house. The door was opened by the housemaid, to whom she said, "Have you anything to give to a beggar?" Recognising her, the girl closed the door. Shortly afterwards there was another ring, and upon prosecutrix again opening the door prisoner threw into her face a quantity of vitriol.

Accused did not deny throwing the vitriol, but did not intend to do more than make the girl smart. She was truly sorry, and if she could replace the girl's eyes with her own she would gladly do so. She admitted being a jealous woman, and thought she had cause for it. The idea of procuring the acid was suggested by reading a similar story of revenge in a newspaper.

The jury found the prisoner guilty, but recommended her to mercy on account of the indiscretion of her husband.

The judge said the crime was a terrible one. He was willing to believe that she did not intend to blind the girl, and perhaps did not know the full consequences of what she was doing. He had tried to be merciful, and she would be sentenced to three years' penal servitude.

(*b*) In March, 1904, at Cape Town, a case is reported thus :—

Towards the end of dinner Miss Marais rose, ran across the room, and after some heated words dashed a bottle of vitriol in Mr. Piet Marais's face. He was seriously injured, and, it is feared, will lose his eyesight.

Conviction followed.

(*c*) In March, 1904, a remarkable case of assault was heard by the Eastbourne magistrates. The complainant was Henry Andrews, and the defendant Mrs. Pansy Pringle. It appeared that Andrews had complained of Mrs. Pringle to her husband. The parties met and discussed the matter. A lively altercation ensued, in which it was alleged the defendant attempted to stab Andrews in the face with a hatpin. In the evening complainant met Mr. and Mrs. Pringle in the dressing-room behind the stage at the Town Hall. The defendant called complainant a liar and a thief, and then suddenly threw the contents of a glass in his face, at the same time saying, "You will not see daylight again." Complainant's face began to blister, and he was unable to open his left eye, but under medical care he was now recovering. It transpired that the stuff thrown was a mixture of Condy's fluid and pepper. Defendant, who said her only object was to frighten the complainant, was ordered to pay an inclusive penalty of 4*l.* 10*s.*

The material here used would certainly cause great suffering, and must be considered "noxious." For the purposes of the law doubtless the punishment was proportioned to the nature of the liquid.

It is to be hoped that the following is only a rare case :—

At Wolverhampton on March 28th, 1904, John Bennett, labourer, of Wombourne, and Mary Gould appeared in connection with allegations of cruelty to a child aged seven years, Bennett's daughter by his deceased wife. It was alleged that Gould was guilty of cruelty and that Bennett must have been cognisant of it.

An inspector of the National Society for the Prevention of Cruelty to Children stated that he found the child had been burned in the hand with a flat iron and on the soles of the feet with a poker. Her right eye was blackened, the bridge of the nose and the forehead bruised, and there were cuts on the cheek, chin, and knee, while her back was covered with bruises. When remonstrated with the woman said that she got into an awful temper and could not help it. The male defendant said he had repeatedly cautioned Gould against touching his daughter.

Further evidence went to show that from a healthy, bright, and intelligent

child sho degonerated into a dull, apathetic, listless girl, giving incoherent answers to all questions.

The magistrates doscribed the case as deplorable, and sentenced the femalo prisoner to six months' and the male prisoner to three months' imprisonment, each with hard labour.

At the Liverpool Summer Assizes, July, 1895, before Mr. Justice Cave, a somewhat unusual case of burning arose, upon which the papers thus commented :

Another curious case, in which life was sacrificed, also engaged the attention of the court. This, too, was a charge of manslaughter. The prisoner was a girl of sixteen years of age. She had come home late at night, and her mother rebuked her—with a sweeping brush—for keeping late hours. The daughter declared that if she was again struck she would kick over the paraffin lamp, and on the blow being repeated, she carried her threat into practice. A little brother, six years of age, was close at hand; the lamp fell near him, set his clothes on fire, and he was so seriously injured that he died. It was for the manslaughter of the little brother that the girl was indicted. No doubt the fatality arose out of a violent ebullition of temper on the girl's part, but there was not the slightest evidence of felonious intent, or that in kicking over the lamp she desired, or even dreamt, of injuring the boy. This case was solved by the grand jury throwing out the bill, and no doubt the decision assorts with the commonsense of the case. The only regret is that some punishment could not be meted out to a girl who gave unrestrained play to her passions, with such melancholy results; but this regret is qualified by the reflection that no doubt she has received a warning that will serve for the rest of her life.

B. General Exposure to Heat.

The effect of an intensely heated atmosphere in causing death has been but little studied. In one case, the captain of a vessel was charged with manslaughter, for causing a man to be lashed within a short distance of the stoke-hole of a steam furnace in the hold of a vessel. The man died, apparently from the effects of this exposure. The engine-rooms of steamers in the tropics have been observed to have a temperature as high as from 145° to 150° F.; and engineers after a time become habituated to this excessive heat, without appearing to suffer materially in health. In the Turkish bath higher temperatures than this (even 250° F.) have been noted, but there is reason to believe that serious symptoms have been occasionally produced in persons unaccustomed to the bath, and that in some cases death has resulted. In attempting to breathe air heated to temperatures varying from 180° to 200° F., there is a sense of suffocation, a feeling of dizziness, and other symptoms indicative of an effect on the brain; and the circulation is enormously quickened.

In 1861 an inquest was held in London on the body of a stoker of an Aberdeen steamship. He had been by trade a grocer, and was not accustomed to excessive heat. While occupied before the engine furnace he was observed to fall suddenly on the floor in a state of insensibility; and when carried on deck it was found that he was dead. All that was discovered was an effusion of serum into the ventricles of the brain; death had been caused by sudden apoplexy. It is probable that excessive temperature generally operates fatally by producing apoplexy—*i.e.*, heat apoplexy. In some cases a person may sink and die suddenly from exhaustion, or symptoms of cerebral disturbance may continue for some time, and the case ultimately prove fatal.

Death from sunstroke, when not immediately fatal, is preceded by some well-marked symptoms, such as weakness, giddiness, headache,

disturbed vision, flushing of the face, followed by oppression and difficulty of breathing; and in some cases stupor, passing into profound coma. The skin is dry and hot, and the temperature of the body is much greater than natural ("Ann. d'Hyg.," 1867, 1, 423). In one case a boy, æt. 13, remained in a state of semi-consciousness for four days, and then had a cataleptic seizure (*Lancet*, 1870, 2, p. 184). Passauer has considered this subject in reference to armies in Horn's *Vierteljahrsschr.*, 1867, 1, 185. In one instance a medical man, who suffered from an attack while on a voyage to the tropics, was able to note and describe the symptoms from the commencement of the attack up to the eighth day, when he recovered (*Lancet*, 1872, 1, p. 464; also 2, p. 128).

Of late years considerable attention has been paid by military surgeons and others to sunstroke, or as some prefer to call it, heat-stroke.

Three varieties (? stages) are commonly enumerated: 1. Simple syncopal attacks exactly like vagus inhibition; 2. Conditions of moderate hyperpyrexia up to, say, 105° and 106°; and 3. Exaggerated by hyperpyrexia up to 109°, 110°, or even higher.

It is difficult to see how the condition in any case can go beyond a coroner's inquest, for which purpose it is sufficient that a medical jurist should be aware of the existence of such cases as he should be aware of other diseases. The symptoms are fully described in standard text-books on medicine, and need not be enumerated here. The reader is referred to an article by Dr. Sambon in the *B. M. J.*, March 19th, 1898, for a full account of it; also to the *Lancet*, August 26th, 1899, containing a report of a discussion on the subject at the meeting of the British Medical Association.

The experiences of those who escaped from the terrible volcanic eruption in the West Indies in 1902 give a very graphic description of the sufferings caused by breathing very hot air.

Spontaneous Combustion.

It is nearly a century and a half since the hypothesis of the spontaneous combustion of the human body took its origin. It was readily accepted by those who could not in any other way account for the phenomena, and who were incompetent to reason correctly from recorded facts. At that date the facts connected with combustion had not even been discovered. All bodies were supposed to hold within them a principle of fire (*phlogiston*), which might be eliminated from them under certain conditions. When a person was found burnt, and no cause was apparent, the fire was supposed to have had a spontaneous origin—*i.e.*, within the body of the deceased. Any such theory that may ever have been genuinely entertained must now be considered as absolutely erroneous, and without a tittle of good evidence to support it. The medical jurist must be careful, however, to note the word *spontaneous* in connection with the theory, for it is the idea contained in that special word which is so opposed to any known facts in connection with the human body. Chemists are aware of a few circumstances under which ignition does spontaneously arise from the juxtaposition of two bodies (pure potassium and water, for example),

neither of which need be even warm; but assuredly no such bodies have ever been found, nor ever arise, in the human body under ordinary conditions or under any conditions known to science. The particular case quoted in former editions of this work, upon which the theory in part rested, may now be consigned to oblivion; the curious will find it in Taylor's "Elts. of Med. Jur.," 1836, 1, 254.

While thus absolutely rejecting any doctrine of spontaneous combustion, it must be admitted, on the other hand, that there are cases recorded by credible authorities which require some explanation to account for the unusual amount of destruction (burning) which has been produced in a human body by what are at first sight very inadequate means; a doctrine has hence arisen that under certain circumstances the body does acquire preternaturally combustible properties.

In all such cases a candle, fire, or some ignited body has been at hand, and the accidental kindling of the clothes of the deceased has been at least a possibility, if not even probable, and no further explanation has been required of the *origin* of the fire; but the amount of destruction of the body compared with that of surrounding objects has certainly in some cases been remarkable. Before attempting any explanation we may quote a few illustrative cases :—

Ogston, senr. and jun. ("Lect. on Med. Jurispr.," pp. 463, 559), relate the two following cases of preternatural combustibility which came within their own experience. A woman, aged sixty-six, of intemperate habits, was left in her house alone. An hour later her body was found on the third step of the stair near the kitchen; the step on which the corpse rested, and one of the spokes of the wooden hand-rail, being charred, as were the seat of a chair and a small portion of the front of a straw mattress on a bed, both in a kitchen on the same floor and adjoining the staircase. Contrasted with this moderate amount of combustion exterior to the woman's body, was the extent of its effects on herself. On the front of the head and face the absence of the soft parts left the exposed bones blackened and calcined. On the back of the neck and chest patches of a greasy charcoal were found here and there; and, beside them, the spinal column and several of the ribs were exposed and burned black. The abdominal wall was wanting, the intestines a burned and blackened mass, and the surface of the liver calcined. The upper limbs were distorted, the elbows strongly flexed, and everywhere charred to a great depth; the bones, however, even of the fingers, preserving their position. The right thigh had its deeper muscles still uncharred, but presenting the appearance of roast beef, and was very dry. The skin and superficial muscles were completely burnt away. The right leg, only partially attached to the thigh, was entirely converted into a greasy black charred mass, even the bones not escaping. The right foot, totally detached from the leg, had been changed into a soft, black, greasy and shapeless cinder. The left thigh, leg, and foot were in a condition similar to the right. Not a vestige of clothing remained anywhere. In the second case a woman, aged sixty, was left by her husband in bed, apparently in her usual health. Three hours later smoke was noticed issuing from the room, and the woman was found dead close to the fireplace, in which there were then only a few nearly extinguished embers; her nightdress, her only clothing, was on fire. It was supposed that two hours previously, and an hour after her husband had left her, the deceased had got out of bed to light the fire in her room. The whole of the right side of the body was more or less burned, the burns being in all stages, from mere reddening of the skin to its complete destruction, along with that of the flesh underneath it. The flesh of the right arm was charred down to the bones, and the elbow joint was laid open. The superficial muscles of the right thigh were burned away, and the deeper muscles roasted. The right side of the face and head were charred. The right breast was roasted. There were burns of the first and second degrees on the left left arm and hand. The belly was much swollen. In both these cases the combustion appears to have originated from the ashes in the fireplaces, but, in the

opinion of Ogston, they seemed insufficient to account for the extreme destruction of the bodies without supposing that they were in a state of unusual readiness to support combustion. For another instructive case of so-called spontaneous combustion, see *B. M. J.*, 1888, 1, p. 841.

The following case occurred in France. The body of a man was found lying in bed, and in a state of combustion, by some persons who entered his bedroom in the morning. The chamber was filled with a dense smoke, and one of the witnesses asserted that he saw a small whitish flame playing around the body of the deceased, which receded from him as he approached. The clothes of the deceased and the coverings of the bed were almost entirely consumed; but the wood was only partially burnt. There were no ashes, and there was but a small quantity of vegetable charcoal; there was, however, a kind of mixed residue, altered by fire, and some pieces of animal charcoal, which had evidently been derived from the joints. The deceased was in the habit of carrying lucifer-matches in his waistcoat pocket, and, according to his usual practice, he had had a hot brick placed at his feet when he went to bed the preceding evening. Two hours afterwards his son and daughter-in-law passed by the door of his room, but there was nothing which attracted their attention. It was only the following morning, early, that his grandson found his body in the state described. The deceased was seventy-one years of age. He was not fat, nor was he addicted to drunkenness. The temperature of the air was low; and there were no electrical manifestations. The son and his wife were suspected of having murdered the deceased, and afterwards burnt the body in order to conceal the traces of the crime. The body, which had been buried, was exhumed and examined. The partially burnt cravat was still around the neck, and part of a sleeve of a nightshirt was found. The hands, completely burnt, were also attached to the forearms by some carbonised tendons, which gave way on the slightest touch. The thighs were detached, so as to resemble a wilful mutilation, but for the discovery of animal charcoal about them. From these facts, Masson considered it impossible to ascribe the changes to the effect of accidental burning; and as they could only be produced by violent combustion continuing for some time, he drew the inference that the burning must have resulted from some inherent cause in the person, probably roused into activity by the hot brick placed at the feet of the deceased. The burning once commenced, would be easily supported by the state of the tissues. Hence the case was, in his opinion, to be referred to the class of spontaneous combustions. Orfila is reported to have coincided with Masson in this opinion, and the accused were acquitted (*Gaz. Med.*, September 4th, 1847). With respect to the medical opinion, that a long-continued action of a strong heat was necessary in order to produce the effects observed, it may be remarked that it is not possible to assign the degree of the duration of the heat which is required to produce particular effects on the body. It appears probable that Masson had underrated the effects which are liable to follow from an accidental ignition of the clothes.

The following is quoted from Mann, "For. Med.," p. 253, as recorded in the *Medical Chronicle*, 1891:—

In a case reported, with a history of the subject, by Reynolds, the abdominal wall was charred completely, and there was a large hole about eight inches long in the middle line; the face was crimson as from fire, but not blistered; the hands, stretched above the head, were unburnt; the arms were burnt and blistered, but not blackened; the thighs were burnt to the bone as far as the knees, where the burning abruptly ceased. It is evident that the combustion started in the abdomen, and in this instance spread further down than is frequently the case. The woman was lying on her back with the thighs and knees well flexed, so that the former would be brought into close contact with the abdomen, and would, therefore, be subject to the full play of the flames; the effect of the heat on the anterior muscles of the thighs would be to shorten them, and thus, in the first instance, to draw the thighs more closely towards the abdomen. The burning had taken place either before or immediately after death, as blistering with signs of inflammation was present on the surrounding parts.

A case is reported by Bertholle (*L'Union Med.*, November 19th, 1870); and by Strohl ("Ann. d'Hyg.," 1871, 1, 228). A woman addicted to drinking alcoholic liquids to excess, including *absinthe*, having drunk largely, went into her bedroom, and two hours afterwards, her husband, in attempting to enter the room, found the

door so hot that it gave him the sensation of burning. An alarm of fire was given, and the room was entered by a window. There was a nauseous odour and a sense of suffocation on entering. The dead body of the woman was found on the floor between the bed and the hearth—the head being partly under the bed, and the legs across the hearth. There was no fire in the grate, and the register was down. The floor on which the body was lying was more carbonised than burnt, and on it were found fragments of bones—some of the ribs, a hand, and incinerated remains. The head, which was swollen and of a violet-red colour, presented no mark of burning. The hair was not burnt. The upper part of the trunk was not burnt, but was covered with a black powder, the residue of the burnt clothing. The left arm had disappeared from the shoulder. The right arm had lost the hand, which was disarticulated at the wrist. The elbow joint was exposed, but the muscles of the arms were not destroyed. The left side and front of the chest were widely open, but there was no trace of the thoracic viscera. The lower ribs were separated. The walls of the abdomen were gone,—its cavity was empty, the viscera being reduced to a greasy black soot adhering to the vertebræ. The bones of the spine and pelvis remained, but the muscles and fasciæ had disappeared. The lower limbs from the thighs downwards were entire, the skin being covered with a black powder—but there were no blisters or vesications on these parts. It is further stated that, although there was no visible source of fire or ignition in the room—and the bed and its furniture had escaped burning—the floor was still burning but without flame, when the room was entered. No combustible in the shape of candle, matches, or fuel was found near the body. No noise or cry of alarm was heard, and the people living opposite saw no light or flames in the chamber or smoke issuing from it. The complete destruction of the clothes by burning in this case shows that the fire was *ab extra*, and although no sources of combustion were found in the room, still this does not preclude the possibility of an accident from this source. The woman may have had matches about her, and in her intoxicated state an accident may have easily occurred, by which her clothes were ignited, and led to the combustion of the body as well as of the matches. This, at any rate, is more probable than the theory that the viscera of her body should have spontaneously acquired such a temperature as to lead to the complete destruction of her clothing. A case like this proves nothing in favour of the theory of spontaneous combustion. It is similar in its details to that of Mrs. Pulley, a case of murder with an attempt at concealment (*vide infra*). The unequal burning of the body was observed in both cases.

What, then, can be offered as the explanation of such cases? their occurrence is established beyond doubt. There are several points in this connection that may be briefly considered :—

(*a*) Experiments.
(*b*) Influence of alcohol.
(*c*) Influence of gases in the living.
(*d*) Influence of gases formed after death.
(*e*) Influence of fat.

(*a*) **Experiments.**—Dr. Taylor in the last edition of this work discarded the idea altogether, stating :—"Such a theory as this, however, is not required to explain the facts. Dry animal solids readily burn, but the soft parts, either in the living or recently dead body, contain as much as 72 per cent. of water, which renders them highly incombustible. Until a large proportion of this water is evaporated, the substance does not undergo combustion. In many experiments made on different organs and on different bodies the author has not observed that different parts of the same body or the parts of different bodies have varied in their degree of combustibility. The bones alone have withstood a greater degree of heat, from the large proportion of earthy matter contained in them. The experiments have led to this result—the flesh and the organs generally are very difficult of combustion, and can be completely consumed only in a strong fire and under a powerful

current of air. Experiments on the bodies of animals have shown that they possess the same property of difficult combustibility. The presence of alcohol in flesh does not render it combustible. The alcohol will burn, but the flesh can only be burned by removing from it the substance which interferes with its combustibility—namely, water. Tissues which have undergone extensive fatty degeneration may, nevertheless, become unusually combustible, so as to become readily inflamed on the application of the moderate heat of a spirit lamp." He then quotes and dismisses the following case :—

In 1864 a woman given to habits of intoxication was found dead in her room. Her clothes were on fire, and a chair had been burnt. The room when entered was filled with a thick black offensive smoke. On examination it was found that some of the bones were completely deprived of flesh. In the absence of a fire or candle (which was still burning on the table) this might have been set down as a case of spontaneous combustion, or, by reason of the flesh being burnt from the bones, at least as a case of preternatural combustibility, whereas it was nothing more than a casualty by fire.

In making experiments such as Dr. Taylor did it must be remembered that the alleged condition of preternatural combustibility is admitted to be very rare, so that a limited number of experiments could really prove or disprove little or nothing.

(*b*) **Influence of Alcohol.**—While it is generally observed that the bodies which seem to be unusually combustible are those of persons who during life were much addicted to alcohol, and had consequently become very fat and bloated, it is by no means clear that the alcohol played any *direct* part in producing the condition ; it is true that the fatal accident generally happens when the victim is very drunk, but on the other hand the experiments above by Dr. Taylor and others, quoted by Mann, prove clearly that a mere soaking in spirit will not materially assist the combustion of the body.

(*c*) **Influence of Gases in the Living.**—In the *B. M. J.* for 1886, a case is recorded by Dr. Beatson, in which a man set fire to his own breath in blowing out a match ; and in the same journal, vol. 1, 1890, Dr. McNaught records a remarkable case, in which he burnt the gas issuing from some vomit. We thus have clear demonstrated proof that, even during life, gases may be formed in the alimentary canal which are capable of igniting on the application of a flame. It is conceivable that such might also continue to be formed for a short time after death. Mann makes a pregnant remark in this connection (*l.c.*, p. 253) :—"It has been noticed in all cases of preternatural combustibility that the trunk is the original site of the combustion."

(*d*) **Influence of Gases formed after Death.**—Within recent years bacteriology has thrown a possible light on the subject by the discovery of a micro-organism (*M. ærogenes capsulatus*), which possesses the power of decomposing animal matter with the evolution of large quantities of gas ; gas, too, which will burn on the application of a light. Gull, in the *Med. Times and Gaz.*, 1885, reports a case of this kind ; the editor, in 1898, met with two or three cases in the post-mortem room at the London Hospital. They were investigated by Dr. Bullock, the bacteriologist to the hospital, who gave the editor a demonstration of the inflammability of the gas. The bacillus killed

cats readily. It offers a satisfactory explanation which might be possible in some cases. The following is an example:—

In 1865, a gentleman, æt. 30, died in the south of England of typhoid fever. It was noticed that there was great tympanitis. His remains were taken to Garston and interred in the family vault in the parish church. The body was in a shell, enclosed in a patent metallic coffin and an oaken one. About thirteen months after the burial a foul smell was perceived in the church, and it was found to issue from a crevice in the floor immediately over the vault in which the coffins had been placed. The vault was opened, and it was then found that the coffins in which the body was placed had burst opposite to the breast, and liquid matter was oozing from the body. The coffins were filled with sawdust, and the vault was left exposed for the night. The gas, which had been lighted in the church during the exploration, was turned off at the meter, and, as it was supposed, all was left quite safely. The next morning, when the workmen entered, the vault was found to be on fire, burning, as the sexton said, with a bluish flame and a most offensive smell. By throwing water and earth on the burning mass the flames were extinguished, and it was then found that the wooden coffin of the deceased and his remains were entirely consumed, with the exception of the silver coffin-plate and a portion of the intestines. Another coffin in the same vault, at a short distance from it, was slightly burnt at the side.

For such a complete destruction of the body to have taken place, the fire must have been going on for some hours before discovery. None of the woodwork or any other part of the church was injured, and the place was found secure as on the previous night. Many persons set it down to spontaneous combustion, but it was found that one of the workmen had been smoking in the vault, and might have carelessly thrown down the lighted paper which he used. This may have kindled the cloth covering of the coffin and sawdust, and assuming that the gases issuing from the body were of a combustible nature, like those described as issuing from dead bodies advanced in putrefaction, the results might be accounted for without reference to the theory of spontaneous combustion. The only inexplicable fact of the case is, that the bones are stated to have entirely disappeared, as these are chiefly formed in incombustible mineral matter—phosphate and carbonate of calcium. Dead bodies may, as it has been elsewhere stated, emit light and heat, and evolve inflammable gases. But these gases require a full red-heat, in order that they should burn and produce the usual effects of burning. In this case the sawdust no doubt acted as fuel, and thus led to the complete burning of the body.

(*e*) **Influence of Fat.**—It has already been noted that the bodies that are unusually combustible are usually fat and bloated. It is common knowledge that fat is a body very susceptible to continued burning when once it is ignited, and it is easily possible to conceive that the clothes and the fat of the body might act as the wick and the tallow in a candle, or perhaps more as the wick in a spirit lamp, the fat burning and leaving the clothes much less affected.

Medico-Legal Relations of Unusual Combustibility.

In this connection the admission of the existence of such a condition is very important, for it may be made the basis of a defence in certain

cases. It frequently happens that the skin is much injured by fire, while the muscles and soft parts beneath have suffered but little. There are some circumstances which may occasionally explain the different degrees in which parts of a body are found burnt. An assassin may have employed methylated spirit, naphtha, benzoline, turpentine or some inflammable liquid, of which no trace can be found: and the great destruction of the body may therefore be due to this extraneous cause, and not to any increased combustibility of its parts. A short exposure to a large volume of flame, owing to its high temperature, will speedily char the flesh and consume it. Articles of female dress, from the quantity of air enclosed between the layers, are capable of producing a considerable volume of flame, and thus the bodies of women are sometimes extensively destroyed, as a result of the accidental burning of the clothes. Even allowing that parts of the human body might, in certain cases, acquire increased combustible properties, the medical jurist will perceive that this admission does not involve any difficulty in the judicial determination of a question of murder by burning; since it is contended that the combustion of a body cannot possibly take place except by contact with some substance already in a state of combustion. But whether the ignition of the clothes of a deceased person took place accidentally, or by the criminal act of another, is a totally different question: it can be cleared up only by general and circumstantial evidence. Assuming that the body of one person will burn more rapidly and completely than that of another, this will be no answer to a charge of causing death by fire. The intention which a person may have had in setting fire to the clothes of another, when he could not possibly know to what degree the burning would extend, is a question for a jury, to be decided from the circumstances. The relation of this subject of the alleged spontaneous combustion of the body to medical jurisprudence appears to have been much exaggerated.

Such a defence as spontaneous combustion might afford, would, if admitted, prove most convenient to assassins. In the case of Mrs. Pulley, whose body was examined in 1860, the circumstances were such as to require but little ingenuity to transform them into a case of spontaneous combustion, although a proper inquiry showed that it was a deliberate murder by strangulation. There was a subsequent burning of the body by means of the clothes, in order to efface the marks of a violent death.

The deceased was found lying on the hearth of her room, about three or four feet from the grate. From the shoulders downwards the body was lying on a boarded floor of oak. The deceased was fully dressed, and parts of her clothing and body had been destroyed by fire. A brass candlestick was lying between the left arm and the body, the top of the candlestick being inclined towards it. The clothes were wholly burnt off both arms, and partly off the upper portion of the trunk. The legs were not at all burnt. A bonnet which the deceased wore was partly burnt. The right arm was elevated by the side, with the elbow resting on the floor. The fingers were partly burnt off, and the remainder of the hand was charred. The left hand, which was stretched out, was not so much burnt as the right. Some ashes from the clothing lay between the left arm and the body, which was not elevated above the floor. The fire was extinguished, but there was a strong smell of burning in the room when it was entered. There had been no fire in the grate. Under the body there was a hole in the oak floor, which had been produced by burning. The features were distorted and swollen, and the eyes suffused with blood. Some parts were burnt to a cinder, whilst others were but little affected by the fire. This case is in some respects similar to that of Millet.

Time required for the Burning of a Dead Body.—It may be a medico-legal question whether, on discovering a body much burnt, it could be determined from its appearance how long a period it would require to produce the amount of destruction observed. An answer to such a question may be necessary, in order to connect a person with the perpetration of an alleged crime, but the question does not admit of a precise answer. A conjecture only can be formed from the facts proved in each particular case. The human body contains a large proportion of water (72 per cent.); this gives to the soft structures a power of resisting combustion. At the same time there is a quantity of fat in the body, varying in different parts, but amounting to an average of about 5 per cent. The fat or oil tends to increase its combustibility, and this is still further increased if it is placed on any combustible article which can imbibe it, such as a rag or a deal floor. The nature of the dress will also make a difference. Under a strong and active flame, which might subsequently burn out before the discovery of the body, there would be a degree of destruction in half an hour which a more slow and smothered combustion would not effect in several hours.

This question actually arose in *Reg.* v. *Hatto* (Aylesbury Lent Ass., 1854).

The deceased, a female, was found dead in her room, and her body much burnt. She was last known to be living at about a quarter-past eight o'clock in the evening, and her body was found, still smouldering with fire, on the floor of the room, at about a quarter-past eleven o'clock. The only persons known to have been in the house were the prisoner and the deceased. The prisoner pretended that he knew nothing of the circumstances attending her death, and endeavoured to make it appear that robbers might have broken into the house and committed the murder at some period of the three hours during which he alleged that he was asleep in bed. It was suggested, in order to exclude this hypothesis—which, however, was sufficiently excluded by other facts—that the act of murder, with the attendant burning, must have occupied the whole of the time intervening between the period at which the deceased was last seen living, and the period at which her body was found. The medical man who examined the deceased found that "both knees were consumed by fire, and the thighs, as well as the private parts, were burnt to a cinder, leaving the shafts of the thigh-bones exposed and charred for several inches. Between the thighs and the feet the floor underneath had been burnt away, and the leg-bones had fallen through the floor, leaving the feet unburnt on the floor." He expressed an opinion that it would take from two and a half to three hours in order to consume the body to this degree, thus covering the whole interval during which deceased and prisoner were in the house together. It should be stated that the clothes of the deceased were much burnt, and that beneath the body there was a hempen mat, so combustible, owing to the melted human fat with which it was impregnated, that when ignited it burnt like a link. The guilt of the prisoner was made sufficiently evident from other circumstances proved in the case, which were quite inconsistent with his innocence. It is obvious that an opinion on such a subject must be in all cases conjectural, since the effects, *cæteris paribus*, depend as much on the intensity as on the duration of the heat. It was indeed just as probable, medically speaking, that, with a large body of flame, the amount of injury met with might have been produced in an hour as in three hours. The confession of the prisoner, subsequently made, shows that the burning observed must have taken place in less than two hours, and perhaps within an hour and a half.

The case of the Countess of Goerlitz, too, is of more importance in this connection than as supporting the silly hypothesis of *spontaneous* combustion, which, Dr. Taylor says, was gravely advanced. The confession shows its absurdity.

The trial took place at Darmstadt in 1850. A valet named Stauff was charged with the murder of his mistress, the Countess of Goerlitz. This lady was found dead in her apartment; the dress on the upper part of the body was almost wholly consumed; the head exhibited the form of a nearly shapeless black mass, in which the mouth was imperfectly distinguishable, with the charred tongue protruding from it. The skin of the neck, as well as the skin and muscles of the face and upper part of the chest, was much blackened and charred. The joints of both arms were charred on their surfaces, and the blackened ends of the bones protruded. There were no marks of fire anywhere on the clothes beyond the margins of the burns on the body. A writing-desk near the body had been partially burnt, and the floor beneath and in front of the desk, over a space of a foot and a half, had been entirely consumed. The feet of a chair placed near the writing-desk were slightly charred. A folding-board and the drawers were also much burnt. It was proved that she had retired to her room between three and four o'clock in the afternoon: the count returned at seven o'clock, and knocked at the door of her ante-room, but receiving no answer he again went out. Had the burning of the body already commenced, he would have perceived it by the smell or by the appearance of smoke. He returned again at nine o'clock; and during his second absence, covering an interval of *two hours*, a bright light had been seen at one of the windows, and a thick smoke issued from one of the chimneys. There is a little discrepancy as to the time, but taking the maximum, the amount of destruction described in this case must have occupied less than two hours, and probably not more than one hour. The physician who was consulted could suggest no other explanation of the facts than that the body of the countess must have taken fire *spontaneously*, while she was engaged in writing at her desk. He could not even admit that her cap or dress might have become by some accident ignited by a candle, because, had this been the case, she would, in his opinion, have had time to escape or call for assistance. The other reasons assigned for the adoption of this hypothesis were that the deceased went to bed in good health, that there was a greasy black or sooty substance found about the room, and that the body exhaled an empyreumatic odour. It may be observed that when the room was first broken into, and the countess was found dead, flames burst out simultaneously from the hangings, the writing-desk, and the floor beneath it, which required to be extinguished by water. The opinion thus given amounted to this: the Countess's body had undergone slow combustion until it reached a full red heat; it then ignited the furniture around—the reverse of the process by which, according to experience, persons are usually burnt to death. The countess was thus found dead in her chamber on June 13th, 1847. On November 26th of that year it was intimated to the count that an inquest would be held; and the valet Stauff, having in the meantime made an attempt to poison his master, was then first suspected of having murdered the countess, the death by burning having up to this time been treated as an accidental occurrence. The body, which had been buried, was not exhumed until August 11th, 1848, *i.e.*, fourteen months after death; it was subjected to a special examination, and the Hessian Medical College, to which the case was referred, came to the conclusion that the countess had not died from spontaneous combustion. The case was subsequently referred to Liebig and Bischoff; and their report was issued in March, 1850, at which date the man Stauff was put on his trial. They found no difficulty in concluding that the body had been wilfully burnt *after death* for the purpose of concealing the murder. There was some doubt whether the deceased had died from strangulation, or from violence to the head. Stauff was convicted chiefly upon circumstantial evidence. He subsequently confessed that the countess had entered her room as he was in the act of committing a robbery. A struggle took place; he seized her by the throat; strangled her, and afterwards placed the body in a chair, piling around it combustible articles of furniture. He set fire to these with the view of destroying the proofs of his crime. It will be observed that the tongue was found protruded, as it is in violent strangulation, and that in its charred state it retained the position given to it by the act of murder.

One of the supposed scientific difficulties in this case was, that the body *appeared* to have been so much consumed compared with the amount of combustibles near it. This, however, seems to have been a mere conjecture. Another point which excited notice was, that the

clothes were not consumed beyond the margins of the burns on the body—a circumstance which has been regarded as a special characteristic of spontaneous combustion, although it simply shows that when the clothing burns without producing much flame the burns on the body are defined by the clothing actually consumed. The dark greasy matter on the furniture and the empyreumatic smell are also conditions which in this case were proved to be results of a homicidal attempt to conceal a murder, and they were not, in any sense, indications of spontaneous combustion. They are always produced when there is a slow and smothered combustion of animal matter. (See for a further report of this case a paper by Tardieu, "Ann. d'Hyg.," 1850, 2, 191, 363, and 1851, 1, 99; also Ogston in *Med. Gaz.*, vol. 46, pp. 899 and 948.)

These cases and some others prove that a short period may suffice for a large amount of destruction, and that, judging by what remains, the combustible materials consumed appear to bear only a small proportion to the parts of the body burnt. This may be accounted for by the large volume of flame produced during the combustion of articles of female clothing.

In reply to a direct question by the editor, the Superintendent of the Woking Crematorium has kindly written as follows:—

"Dear Sir,—In reply to your letter of yesterday's date, I beg to inform you that the average time required for the complete incineration of an adult body, if enclosed in a coffin, is an hour and a half, but without coffin one hour, providing the temperature of incinerating chamber is up to 1,800° F., the os coccyx taking the longest [time to burn]. Coffins should be very light wood, American white three-quarter inch being the quickest to go. Sawdust should be omitted, as it discolours the bone residue very much; but without that the so-called ashes are white, and very beautiful to look at under microscopic view, particularly the cellular parts.

"Yours faithfully,
"W. Sargeant,
"Superintendent."

In 1903 the Cremation Act was passed. For some interesting remarks on it in its medico-legal aspects, *vide Lancet*, 1, 1903, p. 1315. The subject of cremation in all its bearings will be found also fully discussed in vol. 1 of the "Trans. of the Med.-legal Soc."

SECTION X.

STARVATION.

The subject will be briefly discussed under the following headings:—

1. Its Frequency as a Cause of Death.
2. The Symptoms.
3. The Treatment.
4. The Post-mortem Appearances.
5. Was Death due to Starvation?
6. Medico-legal Aspects of Starvation.
7. Baby Farming.
8. Voluntary and Pretended Starvation.

1. ITS FREQUENCY AS A CAUSE OF DEATH.

Dr. Taylor in the previous editions of this work says: "Death from the mere privation of food is a rare event, although, if we were to form an opinion from the verdicts of coroners' juries, its occurrence would not appear to be uncommon in London and other large cities. Still it cannot be denied that starvation should be classed among the forms of violent death, being sometimes the result of criminal neglect or inattention in the treatment of children or of infirm and decrepit persons, and thus constituting homicide, or at other times, although rarely, arising from an obstinate determination to commit suicide in those from whom all other means of self-destruction are cut off."

The editor finds that in the Registrar-General's returns for 1901 there are no less than 172 deaths recorded from neglect and starvation, viz., simple neglect 138, of which no less than 126 were in children under one month; neglect and exposure amounting to murder, 3; neglect and starvation amounting to manslaughter, 31. He thinks, therefore, it is so common as to be hardly deserving the name of a rare event. If to the above the deaths be added from stricture of the œsophagus or of the pylorus from disease, the numbers would be considerably increased.

2. SYMPTOMS OF STARVATION.

The symptoms which attend on protracted abstinence (*chronic starvation*) are thus described by Rostan and Orfila:—In the first instance pain is felt in the stomach, which is relieved by pressure. The countenance becomes pale and livid or cadaverous; the eyes are wild and glistening, the breath hot, the mouth dry and parched, the saliva thick and sparingly secreted. An intolerable thirst supervenes,

which in all cases of attempted suicide by starvation or privation of food from accident has formed the most prominent symptom. The body becomes slowly emaciated, the eyes and cheeks sink, and the prominences of the bones are perceptible; the feeling of pain may be so intense as to give rise to delirium. There is the most complete prostration of strength, which renders a person incapable of the least exertion. After a longer or shorter period the body exhales a fœtid odour; the mucous membrane of the outlets becomes sometimes red and inflamed; and death may be preceded by delirium, or by convulsions ("Cours Elém. d'Hyg.," vol. 1, p. 283 *et seq.*; and Orfila, "Méd. Lég.," vol. 1, p. 415). The symptoms of violent excitement described by these writers have been chiefly witnessed in the cases of shipwrecked mariners, and they may have been partly due to the peculiar effects of a tropical climate (Orfila, "Méd. Lég.," vol. 1, p. 415), or to the drinking of wine, spirits, salt water, or even their own urine (*Med. Times and Gaz.*, 1861, 1, p. 344). Referring to cases which occurred during 1847, Donovan states that the persons who suffered from privation of food during the Irish famine of that year described the pain of hunger as at first very acute, but after twenty-four hours had been passed without food the pain subsided, and was succeeded by a feeling of weakness and sinking, experienced principally in the region of the stomach, accompanied with insatiable thirst, a strong desire for cold water, and a distressing feeling of coldness over the entire surface of the body. In a short time the face and limbs became frightfully emaciated; the eyes acquired a peculiarly wild stare; the skin exhaled an offensive smell, and was covered with a brownish filthy-looking coating, almost as indelible as varnish. This he was at first inclined to regard as encrusted filth; but further experience convinced him that it was a secretion poured out from the exhalants on the surface of the body. The sufferer tottered in walking like a drunken man; his voice was weak, like that of a person affected with cholera; he whined like a child, and burst into tears on the slightest occasion. In respect to the mental faculties, the prostration kept pace with the general wreck of bodily power. In many there was a state of imbecility, in some almost complete idiocy; but in no instance was there delirium or mania, which has been described as a symptom of protracted abstinence among shipwrecked mariners (*Dublin Med. Press*, February, 1848, p. 67).

In addition to the symptoms above described, there is in some cases suppression of the fæces, or if discharged they are in small quantity, dry, and dark-coloured; the urine is scanty, high-coloured, and turbid; the intellect is dull. The person may be exhausted, and remain without motion in one position, or be seized with a furious delirium, which may drive him to acts of violence. In the last stage the body is reduced to an extreme state of emaciation, and before death it evolves an offensive odour, like that of incipient putrefaction. The excretions have also a putrescent odour. The surface of the skin may be covered with spots (petechiæ); and the person finally dies, in some cases slightly convulsed (Orfila, *op. cit.*, p. 415). Chassat found in his experiments on animals that in some instances the animal died after having had successive attacks of convulsions (Beck's "Med. Jur.," vol. 2, p. 80). A healthy man, æt. 65, was by an accident shut up

in a coal-mine for twenty-three days without food. When found he was conscious, and he recognised and named his deliverers. He was so weak that he could scarcely raise his hand to his mouth, and so much emaciated as to excite the surprise of his fellow-workmen by the extreme lightness of his body. Under careful treatment he so far recovered as to give an account of his feelings. For the first two days hunger had been his most urgent symptom. This passed off, and he then began to suffer from severe thirst, which he allayed by drinking some foul water. After ten days he became so weak that he was unable to move from the spot where he had lain down. He slept but little, and not soundly, never entirely losing the consciousness of his situation. His bowels acted only once, but he passed urine freely. The matter brought from his bowels by injections was dark-coloured, like meconium, and very fœtid. He died on the third day after his removal, in spite of every effort to save him, and on the day of his death he was in the following state :—His features were sharp and pale, his eyes sunk ; the skin of the abdomen seemed to touch the back-bone, which could be distinctly felt through it ; his body presented more emaciation than Sloan had ever seen produced by disease ; he had altogether a dried appearance, like that of mummies found in catacombs; his pulse was gone ; his voice was in a whisper, like the cholera voice ; there was uneasiness, increased by pressure in the region of the stomach; his intellect was sound, and remained so until death (*Med. Gaz.*, vol. 17, p. 265).

This case confirms the observation of Donovan that delirium is not a necessary attendant on protracted abstinence, and it proves that a person may die from the effects of abstinence or starvation in spite of the best-directed efforts for his recovery. In the same journal are reported the cases of eight men and a boy who were shut up in a coal-mine for eight days without food (*Med. Gaz.*, vol. 17, p. 390) ; but the symptoms here noted were rather those of hunger than of long abstinence. They all suffered from excessive thirst ; they were all troubled with ocular illusions, showing cerebral excitement. The occurrence of ocular spectra and other symptoms indicative of a depressed state of the nervous system has also been noticed by Casper ("Handbuch der Ger. Med.," 1857, 1, 374). According to Martyn, the emaciation in starvation is characteristic ; it is a withering or shrivelling up of the skin, which has lost its elasticity, giving to youth the aspect of age. Death, when not hastened by disease, is slow and imperceptible, or it is precipitated by syncope from sudden effort, or by exposure to severe cold. Delirium is not, according to him, a symptom of starvation (*Med. Times and Gaz.*, 1861, 1, p. 344).

The period which it requires for an individual to perish from hunger is subject to variation ; it will depend materially upon the fact whether a person has had it in his power or not to take at intervals a portion of liquid to relieve the overpowering thirst which is commonly experienced. The smallest portion of liquid thus taken occasionally is found to be capable of prolonging life. It is probable that in a healthy person under perfect abstinence death would not commonly take place in a shorter period than a week or ten days. This opinion derives support from the results of those cases in which there has been abstinence owing to disease in the throat and difficulty of swallowing

food. Age, sex, state of health, and the effects of exposure to cold may accelerate or retard a fatal termination.

In death from starvation, as observed in hospital, there is commonly a subnormal temperature and a gradual numbing of the faculties, ending in a condition of coma from exhaustion.

3. TREATMENT.

Warmth, and a very gradual increase in the amount of warm liquid food, is the only appropriate treatment.

4. POST-MORTEM APPEARANCES.

The body is shrunk and emaciated, and remarkable for its lightness. The skin is dry, shrivelled, and free from fat. The muscles are soft, deprived of fat, and much reduced in size. The stomach and intestines are usually found collapsed, contracted, and empty, the mucous membrane being thinned and sometimes ulcerated. The liver, lungs, heart, kidneys, and the great vessels connected with these organs, are collapsed and destitute of blood; the heart and kidneys free from any surrounding fat; the gall-bladder distended with bile; the omentum shrunk and destitute of fat. In one case the body was observed to be extremely emaciated; the intestines were collapsed; the stomach was distended with air, and slightly reddened at its greater extremity. The omentum had almost disappeared, and was entirely destitute of fat. The liver was small, and the gall-bladder distended with bile. The other viscera were in their normal state (*Med. Gaz.*, vol. 17, p. 389). Tomkins inspected the body of a man who died from starvation. The face was much shrunk and emaciated; the eyes were open, and presented a fiery red appearance, as intense as in a case of acute ophthalmia during life. This red appearance has been met with by Donovan in death from exposure to cold (*Dublin Med. Press*, February 2nd, 1848, p. 66). The skin was tough, and there was scarcely any cellular membrane to be seen. The tongue, lips, and throat were dry and rough. A peculiar odour was exhaled from the body. The lungs were shrunk and contracted; the investing membrane was slightly inflamed. The stomach and intestines were empty, but quite healthy; the gall-bladder was nearly full of bile, and the surrounding parts were much tinged by this liquid. The urinary bladder was empty and contracted (*Lancet*, March, 1838, p. 903).

In some cases inspected during the Irish famine, Donovan states that the appearances which he witnessed were extreme emaciation, total absorption of the fatty matter beneath the skin of the body, total disappearance of the omentum, and a peculiarly thin condition of the small intestines, which were so transparent, that, if the deceased had taken any food immediately before death, the contents could be seen through the coats of the bowel. On one occasion he was able to recognise a portion of raw green cabbage in the duodenum of a man who had died of starvation. This thin condition of the coats of the intestines he looks upon as the strongest proof of starvation. The editor has repeatedly found this atrophied and thin state of the intestines as the only observable condition in the bodies of children who have died of summer "diarrhœa and vomiting." Death in such

cases is no doubt partly due to starvation. The gall-bladder was usually full, and the parts in the vicinity of it were much tinged by the cadaveric exudation of bile; the urinary bladder was generally contracted and empty, and the heart pale, soft, and flabby. There was no abnormal appearance in the brain or lungs. Martyn assigns as a condition of the intestines diagnostic of starvation that they are not only contracted, but shrunken and diminished in size, shortened in length as well as in calibre, and like a mere cord, as if the canal was obliterated (*Med. Times and Gaz.*, 1861, 1, p. 344). He met with this state in three cases, once in starvation from want of food and twice from total obstruction to its ingestion. The following appearances were noticed in the cases of two children named Aspinall, who died from starvation, the elder aged one year and ten months, the younger four months:— In the body of the elder there was extreme emaciation, without the slightest trace of disease in any of the viscera. Some dirty creamy fluid and four cherry-stones were found in the small intestines, but no distinct fæcal matter, a few grains of which, however, were found in the large intestines; scarcely a trace of fat was visible. In the infant the same appearances were presented, although the emaciation had not proceeded to the same extent. The evidence produced on the trial proved that the mother spent in drink the money given to her for household expenses, and that the children's food and clothing were neglected. The prisoners were tried for murder, in accordance with the verdict of the coroner's jury. The judge ruled that the wife was in law the husband's servant, and if it were proved that he had supplied her with sufficient money, he must be acquitted; and if he had not, the wife must be acquitted. The jury acquitted the man, and brought in a verdict of manslaughter against the woman ("Proc. of Liverpool Med. Soc.," 1855–56). In some of these alleged deaths by starvation, ulceration of the bowels is met with. This has been considered to arise from want of food; but Donovan did not meet with it in those who died of lingering starvation (*Dublin Med. Press*, February 2nd, 1848, p. 66).

These appearances, in order to throw any light upon the cause of death, should be accompanied by an otherwise healthy state of the body, since, as is well known, they may be produced by many organic diseases, and death may be thus due to disease, and not to the mere privation of food. It will not be always easy to say whether the emaciation depends on disease or want of food, unless we are put in possession of a complete history of the case. On this account, in all charges of homicidal starvation, the defence generally turns upon the co-existence of disease in the body, and the sufficiency of this to account for death. (See, in reference to medical evidence on this subject, the case of *Reg.* v. *Pryke*, Chelmsford Sum. Ass., 1840; and *Reg.* v. *Staunton and Rhodes*, p. 147.)

Dr. Stevenson believes that the only diagnostic signs of starvation are—emaciation, absence of fat from the body, distension of the gall-bladder, and a peculiar thinning of the walls of the intestinal canal, which is especially noticeable in the intestines; they may become extremely translucent.

While agreeing in the main with these conclusions, the editor would express a caution against too much reliance being placed on a

full gall-bladder, as this is of very frequent occurrence in all kinds of deaths, and indicates nothing more than the non-passage of food over the orifice for some few hours preceding death.

The following account of an autopsy, with the opinions expressed thereon, was furnished to the editor by Dr. Nelson Hardy, of Dulwich:—

"On September 18th, 1903, I was sent for to the East Dulwich police-station, and shown the dead body of a male child, apparently about six months old, wasted to a skeleton. Rigor mortis was not present, but decomposition had commenced.

"*Post-mortem made September 19th.*—Decomposition had considerably advanced. Body like a skeleton with the skin stretched over it. Eyes sunken and cheeks hollow. Bones of face, limbs, and trunk project. Teeth in both upper and lower jaw, but not erupted. Length, twenty-six inches; weight, eight pounds two ounces. Body much emaciated, not a particle of fat being found either under the skin or about the internal organs. The stomach and intestines were empty and contracted, no trace of food in them, and no disease being found. The gall-bladder was distended with bile. The heart, lungs, and liver were healthy, but small. The bones of the skull had to be sawn through. The brain was apparently healthy, but weighed thirty-one ounces. Special search was made for any organic disease, such as tubercuIosis, stricture of the œsophagus, or disease of the stomach or bowels, to account for the wasting, but none such was found.

"*Conclusions.*—(1) The appearance of the body is that of a six or seven months old child, and the unerupted teeth would point to about the same age; but in weakly children dentition is sometimes delayed to eighteen months, or even longer. On the other hand, the length, twenty-six inches, the condition of the bones of the head, which at that age are usually soft enough to be cut through with a knife, and the full development of the brain, point to ten or twelve months as being the more likely age. (2) In the absence of disease, gradual starvation must be looked upon as the cause of death. If water or milk and water in diminishing amounts had been given, this process might have extended over two months, or perhaps more.

"At the inquest a verdict was found of death from starvation."

5. WAS DEATH DUE TO STARVATION?

If in an autopsy we find the appearances described above, and especially the absence of fat, we are justified in saying, in the absence of any disease, that death was at least accelerated, if not actually caused, by an absence of either (*a*) sufficient food to maintain life, or (*b*) ability to utilise and absorb the food that had been given. If disease is found as well as these signs of starvation, the problem is more complicated, for it is only in certain special cases (stricture of œsophagus or pylorus, for example) that we are able to positively ascribe the wasting to the *mechanical* effects of disease. In the majority of cases it is impossible to disentangle the possible or probable *physiological or pathological* effects of the disease, from the effects of alleged starvation and neglect.

The difficulties connected with medical evidence of death from starvation were well illustrated in *Reg.* v. *Mitchell* (Oxford Lent Ass., 1861).

The accused was charged with the manslaughter of his servant, a woman æt. 24, by withholding from her sufficient food. The evidence failed to support this charge, although there could be no doubt that deceased had died either from an insufficient supply of food, or from the fact that the food which she had taken, or had it in her power to take, was not adequate to support life. One of the witnesses for the prosecution, who saw the deceased for the first time on January 4th, found the woman feeble, emaciated, and suffering from exhaustion; she complained of great weakness and giddiness. There was no natural disease to

which these symptoms could be referred. In spite of her removal and the use of stimulants, she died in five days. On inspection there were no appearances to account for death from natural causes. The body was much emaciated, and so light that it only weighed fifty pounds; and there was no fat. The intestines were thin and transparent in parts; the stomach and small intestines were much contracted. There was an entire absence of fat from the omentum and mesentery; the gall-bladder was much distended with bile. The other organs of the body were healthy, and there was no disease in any part to account for the emaciation. Two medical gentlemen confirmed this evidence at the trial, and they all agreed that the appearances were consistent either with death from starvation or insufficiency of food, or with the non-assimilation of food. It was suggested in defence that deceased might have died from chronic diarrhœa; but there was no proof that this had existed to a degree to account for death, and during the last five days of her life it was proved that she did not suffer from diarrhœa at all. The statement of the deceased went to show that food was not withheld from her, and the prisoner was acquitted.

The cause of death is, however, a separate question from the alleged criminality of the prisoner. On this point there is no reason to doubt that the opinion given by the three medical witnesses was perfectly correct, and justified by the facts which they had observed. The symptoms and appearances, as well as the entire absence of any natural disease to account for them, lead to the conclusion that deceased could not have taken sufficient food to support life, or that that which she took was not properly assimilated; and in either case the symptoms and appearances would be those of death from protracted abstinence or starvation. As she was of a scrofulous habit and of weak constitution, and the weather at the time she was first seen had been remarkably cold, it is probable that these indirect causes aggravated in some degree the effects of insufficient nutriment. It was suggested that this could not have been a case of death from starvation, because, on the day before her death, the deceased became delirious; and delirium, it was alleged, is not a symptom of starvation. This may be true of some cases; but the occurrence of delirium in this instance was not sufficient to set aside the evidence furnished by the symptoms and the general condition of the body of deceased. Delirium may be the result of great bodily weakness, on whatever cause depending; it is probably more rare in cases of chronic diarrhœa than in those of protracted abstinence. Too much importance must not be attached to its presence or absence on these occasions, since experience shows that there are few cases of starvation, accurately observed, in which the symptoms have been strictly accordant; and it would be going too far to assert that the occurrence of delirium before death would justify a medical witness in asserting that death could not have been caused by starvation when the condition of the body and the whole history of the case allowed of no other reasonable interpretation of the facts.

6. MEDICO-LEGAL ASPECTS OF STARVATION.

Starvation is commonly the result of *accident* or *homicide;* but this is a question purely for the decision of a jury, and can seldom be elucidated by medical evidence. The withholding of food from an infant forms a case of homicide by starvation, on which a medical opinion may be occasionally required. Gurney, B., held that the *mother*, and not the father, was bound to supply sustenance to an

infant at the breast. The child in a case was ten weeks old, and the father was charged with wilful murder, on the ground that he had not supplied it with food. The grand jury ignored the bill, under the instructions of the judge, upon the ground above stated (*Rex* v. *Darey*, Exeter Lent Ass., 1835). But it is probable that there were particular circumstances in the case which led to this decision. The facts may be of such a nature as to inculpate the father by proving that he was accessory to the death of the child. But where the husband and wife were charged with the murder of an apprentice to the husband by using him in a barbarous manner, and the opinion of the medical witness was that the boy had died from debility occasioned by the want of proper nourishment, it was held that the wife was entitled to be acquitted, as it was the duty of the *husband*, and not of the wife, to provide sufficient food and nourishment for an apprentice (*Rex* v. *Squire*, Starkie, vol. 2, p. 947). Starvation is rare as an act of homicide, but it must not be supposed that the law implies by this the absolute deprivation of food; for if that which is furnished to a person be insufficient in quantity, or of *improper quality*, and death be the consequence, malice being at the same time proved, then the offender equally subjects himself to a charge of murder. Many years since a woman of the name of Brownrigg, who was accustomed to take parish apprentices, was tried and convicted of the murder of two children, who had died in consequence of the bad quality and small quantity of food furnished to them by the prisoner.

In 1877, a man named Staunton, his mistress Alice Rhodes, his brother, and his brother's wife were tried and convicted (C. C. C., September, 1877, *Reg.* v. *Staunton and Rhodes*) of the murder of Harriet Staunton, the wife of the first-named prisoner. Harriet Staunton was a woman, æt. 40–50, of weak intellect; her husband had formed a criminal connection with Alice Rhodes. The deceased and the prisoners all lived together in a small house in the country. She appears to have been submitted to a systematic course of cruelty and neglect; and, as was alleged, this was carried to the extent of starving the woman to death. Just previous to her decease she was removed to a lodging at Penge, where she died shortly after she was seen by a medical man. The circumstances and the mode of her death (coma, rigidity of one arm, and unequal pupils) giving rise to suspicion, an inquest was held, and an inspection made. The following is a summary of the appearances observed after death:—The body was emaciated and very dirty; lice and eggs of lice and bugs were in the hair; the skin, like parchment, was drawn tightly over the face; the breasts and the abdomen were shrunken. The brain was healthy, with the exception of a small recent patch of tubercular deposit upon the arachnoid membrane of the upper part of the left hemisphere, two-thirds of an inch in diameter. There was post-mortem fulness of the vessels. There was no trace of meningitis, no effusion, the presence of adhesions was doubtful, and the base of the brain was healthy. The heart was small in weight, empty, and healthy. The lungs were healthy, with the exception of about an inch and a half at the upper part of the left lung, which was the seat of inactive tubercular deposit. There was no disease or inflammation of the peritoneum. The

omentum was scarcely visible. The gall-bladder was full. The stomach had some undigested food in it, consisting of milk and chopped or chewed eggs, which was distinctly visible through the thinned coats of the stomach. There was a patch of inflammation on the interior of the stomach, on the lesser curvature. The intestines were collapsed, shrivelled, and completely empty. The rectum was congested. There was a total absence of fat from all parts of the body. All the organs were considerably below the normal weight. No poison was found in the body. At the trial very positive statements were made as to the cause of the woman's death having been starvation. Under the influence of these opinions, the judge summed up the case in a manner which led to a conviction. The case excited a large amount of interest; and subsequent to the trial several eminent medical men came forward and gave emphatic expression to opinions that there was no medical proof that the death of the deceased was caused by wilful starvation. There is no doubt that, had not some of this evidence been excluded at the trial by legal technicalities, no conviction for *murder* would have taken place. The cross-examination of the medical witnesses for the prosecution elicited the fact that there were miliary tubercles in the brain. Indeed, there was sufficient evidence to show, in the opinion of the highest medical authorities, that the woman might have died from disease, and that, at all events, culpable neglect to provide the poor creature with such comforts as her condition demanded might well have brought about her death. Alice Rhodes eventually received a free pardon, it being difficult to hold her legally responsible for the result; and the three other prisoners had their capital sentences commuted.

(7) BABY-FARMING.

Under this heading may be described one of the most revolting crimes known to the law. In effect it amounted (and still amounts) to taking babies and young infants into a house for the ostensible purpose of nursing and bringing them up and deliberately murdering them by starvation and neglect and even by less doubtful means.

The following article from the *Lancet*, vol. 1, 1903, p. 251, is so true and such an excellent account of the terrible crime that it is inserted here nearly verbatim :—

"Several recent criminal trials have drawn attention to the danger with which infant life is threatened by the practice of 'baby-farming,' but none since the case of the infamous Mrs. Dyer, who was hanged in 1896 after a series of cold-blooded murders, has thrown a more lurid light upon the details of this revolting traffic than the trial of the two women Sach and Walters, which was concluded at the Old Bailey on January 16th by the passing of the death sentence upon both the accused. It was shown for the prosecution in the course of the case that the guilty women worked in connection with one another, being in constant communication and sharing the profits of their transactions, while the whole of the circumstances taken together proved beyond any reasonable doubt that each knew and connived at the acts of the other. Sach kept a 'maternity home,' including in her advertisement of it the statement 'baby can remain.' Women—in every case

probably women to whom motherhood meant ruin—came and were delivered at Sach's 'home.' Where their natural feelings for their offspring made them hesitate to dispose of the infants Sach allayed any scruples that they might feel by specious assertions of her power to get the infants adopted into good homes in return for small payments. Immediately after birth the children were taken from their mothers and handed to Walters, who removed them to her own lodgings. In the particular case of the murder upon which conviction has followed a few drops of chlorodyne deprived the newly born infant of life, and the disposal of the body alone remained to be considered. Probably the method with which we are familiar from reading about it frequently in newspapers was the one which Walters intended to employ. She meant to leave the infant's body in a parcel at a railway station or in a railway carriage; but she had already excited the suspicion of a police officer who resided in the same house, with the result that she was arrested at South Kensington station with the corpse in her possession. The arrest of Walters was immediately followed by that of Sach, and the statements of the two women were such as to render it lawful for the prosecution to give evidence of other similar cases at the trial on an indictment dealing with the death of one child only, and the circumstance secured the just conviction of both the miserable wretches. When evidence was forthcoming that other children had been born under Sach's auspices and transferred to Walters, who had disposed of them in some way or other of which no explanation was forthcoming, and when it was proved that one such child had been seen dead in Walters's arms in a coffee-shop, the possibility of the death which led to the arrest of the prisoners having been due to an accidental overdose of chlorodyne became too remote for acceptance. Similarly it became clear that Sach, though she did not herself kill the children, could not have been ignorant of their fate. It was left open to the accused to prove that they had in fact procured the adoption of infants by well-to-do people in accordance with their proposals to the mothers, but this they were unable to do. Upon proof of the clearest sort both women were therefore found guilty of murder and justly condemned to death.

"From time to time Acts of Parliament have been passed with a view to protect the lives of infants from baby-farmers, and the most recent statute, passed in 1897, was an improvement to some extent upon its predecessors. The policy adopted by the Legislature has been to make it necessary that persons undertaking the care of infants for hire should give notice of what they are doing to the local authority, so that their proceedings may to some extent become the object of supervision and inspection. It is easy to see that the operation of such laws as these can be evaded by a little ingenuity and secrecy on the part of those who ought to give the required notice, but Sach and Walters apparently conducted their business in such a manner that they were not in the eye of the law baby-farmers at all. Sach purported to be the manager of a maternity home, and Walters to be the agent for the transference of the infants to foster-mothers; neither, according to her own statement, was a baby-farmer. The second section of the Infant Life Protection Act, 1897, orders that any person retaining or receiving for hire more than one infant under the age of

five years for the purpose of nursing or maintaining such infants apart from their parents for more than forty-eight hours shall within those forty-eight hours give notice to the local authority. There was no evidence that either Sach or Walters ever had upon her hands more than one child at a time, or that the children ever remained with either of them for so long as forty-eight hours alive. It was further their custom to undertake the entire charge of the children entrusted to them, thus ridding their parents of them in consideration of a sum of money paid down. The obvious dangers of traffic of this kind have attracted the attention of the Legislature, but here, again, Sach and Walters were safe from supervision without any need to break the law. The fifth section of the Act already referred to provides that notice shall also be given within forty-eight hours to the local authority by any person retaining or receiving an infant under the age of two years on consideration of a sum of money not exceeding 20*l.* paid down and without any agreement for further payment as value for the care and bringing up of the said infant. Sach and Walters made their profits larger and at the same time kept themselves outside the scope of this section by the simple process of exacting from the parents of their victims more than 20*l.* With the child of whose murder they were convicted they received 25*l.*, and in the case of one of the witnesses examined 30*l.* had been paid, but they would have been equally safe from the obligation to notify their proceedings had they taken 20*l.* 0*s.* 6*d.* It would be interesting to know who posted these women in the law, and by enabling them to escape lesser penalties has conduced to their conviction for a capital crime. We have entered into the legal aspects of baby-farming with some detail because it behoves our readers to be aware of the existence of bogus maternity homes and of the possibility of their being instituted with the intent to defeat the object of the laws for the regulation of baby-farming."

Quoting again from the *Lancet*, October 7th, 1899 :—

"Notwithstanding the Infant Life Protection Act, reinforced by the efforts of inspectors, the police, and the press, baby-farmers continue to carry on their atrocious calling. Prosecutions are no doubt fewer than they used to be, and we may reasonably, under existing conditions, accept this fact as a proof that the offence itself is not quite so frequent. The danger of exemplary punishment which attends its discovery is more distinctly real, and it is deterrent in proportion. Nevertheless the evil exists. Here and there it even seems for a time to flourish. A woman recently convicted at the Central Criminal Court was found to have six children in her house. Two of these were dead, and a third died from starvation shortly after an inspector's visit. The fact is noteworthy that at the time of detection in this class of cases it is almost invariably found that one or more children are dead or at the point of death. Mr. Justice Phillimore, who gave judgment in the above-mentioned case, appears to have noticed this peculiarity, for he expressed himself somewhat strongly upon the evidently culpable laxity of the Act or its executive instruments. We are inclined to agree with this criticism. No doubt efforts at evasion must occur from time to time, and these may occasionally have some success. It must always be remembered, however, that the Infant Life Protection Act is intended as a preventive measure. If it is to fulfil its purpose as

such it is indispensable that registration and inspection should be carried out at the earliest possible date, and a good deal earlier than they are now. We would further suggest that the inspector's visit should be immediately and regularly followed by that of a medical practitioner deputed by the board of guardians or other local authority."

In *Reg.* v. *Mary Hall* (C. C. C., 1871) it was proved by medical evidence that the food supplied was improper and insufficient, and that the children were drugged with opiates. The evidence showed on the part of the accused, not merely culpable neglect, but a deliberate intention to destroy life.

The difficulty in all cases where no actual poison can be found is to prove that starvation, and not disease, was the cause of death. We have seen how little characteristic are the post-mortem appearances in starvation, and when to this is added the fact which must be admitted, viz., that many children fed on the best and most expensive foods, and tended with the greatest care, often die from simple inability to utilise the food given, it becomes a mere commonplace to say that medical must be largely reinforced by circumstantial and direct evidence before a conviction can be obtained.

(8) VOLUNTARY AND PRETENDED STARVATION.

There are a few cases recorded in which persons have voluntarily abstained from food, liquid or solid, for the purpose of self-destruction. Suicide, as a result of perfect abstinence, is, however, exceedingly rare: the person cannot resist the intolerable thirst or the desire for food when placed within his reach. As it requires a period of at least eight or ten days for the destruction of life under these circumstances—*i.e.*, in the *acute* form of starvation—the resolution to abstain can rarely be maintained, and for the purpose of self-destruction starvation would never be resorted to, except where all other means of destroying life were removed.

Pretended fasting has been a subject of imposture at various times. The case of Ann Moore, of Tetbury, is noticed by most medical jurists as showing how easily even the educated public may be deceived, and how lucrative such an imposition, when it has once taken hold of the public mind, may become. According to her account, she began to abstain from food in March, 1807, and continued fasting for *six years*. It was then discovered, by close watching, that her daughter secretly gave her food and drink. It is stated, however, that during the last watch she had no food of any kind for a period of nine days and nine nights (Beck's "Med. Jur.," 1, p. 58). An imposture of this kind can only be detected by the most minute observation. The case of Sarah Jacobs, the Welsh fasting girl (December, 1869), shows that a watch too strictly kept may have the imposture revealed by the actual death of the person. This girl, æt. 13, is stated to have voluntarily abstained from any kind of food for a period of *two years*. She had kept her bed during that time, lying in it decorated as a bride, visited by hundreds of persons; in fact, she was thus publicly exhibited by her parents as a girl of miraculous powers. Her lips were moistened with water once a fortnight, but, according to the parents, no food was taken. Four professional nurses were set to

watch the girl, and the result was, that, after passing through the usual stages of starvation, she died on the ninth day. She refused to take food at any time, and voluntarily accepted a lingering death rather than reveal the imposture. Her parents and those around her allowed her to die. An inquest was held, and a post-mortem examination gave the following appearances :—The body was plump and well formed; the membranes of the brain were much injected; the brain itself was healthy and of proper consistency. There was a layer of fat from half an inch to an inch thick beneath the skin of the chest and abdomen. The contents of the chest were healthy. The stomach contained three teaspoonfuls of a semi-gelatinous substance, of the consistency of syrup, having a slight acid reaction. The small intestines were empty, and presented no attenuation or thinning of the coats. In the colon and rectum there was half a pound of solid excrement in a hard state, which might have been there, according to the witness, a fortnight or longer. The liver was healthy, and the gall-bladder was greatly distended with bile; the kidneys and spleen were healthy, and the urinary bladder was empty.

The medical evidence at the inquest was to the effect that the child had died from exhaustion as the result of starvation, and the jury returned a verdict of death from starvation as a result of the criminal neglect of the parents in not administering food. They were tried on a charge of manslaughter (*Reg.* v. *Jacobs and Wife*, Carmarthen Sum. Ass., 1870). An attempt was made in the defence to refer death to shock, and not to the want of food. The medical facts relied upon in support of this theory were the presence of fat in the body and the absence of any thinning of the coats of the intestines; but, as was very properly pointed out (*Lancet*, 1870, 2, p. 150), these conditions are only likely to be met with after long or chronic fasting, where the person has survived many weeks on insufficient or innutritious food. In the case of this girl, the only proved abstinence from food was during the last eight days of her life, and this period of time would not suffice for the entire removal of the fat and the thinning of the coats of the intestines. The prisoners were convicted of causing the death of their child by criminal negligence. The father was sentenced to twelve months', and the mother to six months', imprisonment (*Lancet*, 1872, 2, p. 132).

In addressing the jury, Hannen, J., said "that although the unhappy victim herself might have been, and probably was, a consenting party to the fraud, yet parents were bound to supply the wants of their children of tender years; and if the prisoners, in order to avoid detection of the fraud which they had entered upon, had refused their daughter food, they were guilty of manslaughter. In this case the food necessary to support life was not supplied for a period of seven or eight days. If the jury came to the conclusion that the deceased died because during those eight days she had had no food, he presumed that they would also come to the conclusion that during the two preceding years she had been supplied with food." This appeal to common sense should suffice to prevent a belief in any more "fasting" impostures, but has failed of its effect. The desire of a section of the public to know whether a human being could live two years without food has thus been gratified at the cost of life. Any person acquainted

with the rudiments of physiology would know that the application of the test of watching, if really efficient, could only end in death.

In 1880, Dr. Tanner, an American physician, entered upon, and is stated to have successfully accomplished, a forty days' fast. It is doubtful whether this was a great imposture, or a remarkable feat of foolhardy endurance. The conditions under which he was watched were by no means satisfactory. Water was taken at times freely; and at one time it is said that he increased in weight upon a water dietary (*B. M. J.*, 1880, 2, p. 215). No complete medical history of this case has been published.

During March to May, 1890, an Italian, named Succi, underwent a voluntary fast of forty days, apparently without permanent injurious effects. He had, however, free access to simple liquids, and also partook occasionally of a narcotic. At the termination of his fast Succi gradually reverted to a solid dietary. His case merely proved that the body may be deprived of food for a considerable period, and yet remain fairly healthy; it added little or nothing, nevertheless, to our knowledge of fasting from a medico-legal point of view (*B. M. J.*, 1890, 1, 1444).

George N. Robins contributes notes on a recent fifty days' fast, in which, were it not for the extraordinary length of time during which Alexandre Jacques succeeded in keeping body and soul together on a diet of mineral water and a limited quantity of a secret powder, there would be no special interest attaching to this last experiment, most of the symptoms and changes observable being analogous to those recorded in the case of Succi's forty days' fast (*B. M. J.*, 1890, 1, 1444). At the same time there are a few points of difference between the two cases which are worth noticing. At the commencement Jacques weighed 142 lbs. 8 oz., and lost in all 28 lbs. 4 oz., being a little over 19·8 per cent. of his original weight; whereas Succi's loss in forty days was 34 lbs. 3 oz., or 26·75 per cent. The general shrinkage of the body was much the same as in Succi's case, with one remarkable difference. Whereas Succi diminished in height from $65\frac{3}{4}$ inches to $64\frac{1}{2}$ inches, Jacques actually increased from $64\frac{1}{2}$ inches to $65\frac{1}{2}$ inches, the increase being almost uniformly one-eighth of an inch per week. This increase in height was very carefully noted and verified. The loss of weight was not regular. On a few occasions an increase was recorded, but was generally followed by a corresponding diminution the next day. These occasional increases were attributed either to a copious libation shortly before being weighed, or else the non-emptying of the bladder for several hours. The total amount of fluid drunk was 1,784 fluid oz., an average of 35·4 oz. per day (half as much again as Succi took), the greatest quantity in one day being $66\frac{1}{2}$ oz. He passed on the average about 20 oz. of urine, but on some days none at all. On the thirty-seventh day Jacques suffered considerable pain from the presence of scybalous masses in the bowel, which were removed with some difficulty after repeated injections of hot water. The scybala weighed about three-quarters of a pound, and were of a very dark greenish brown colour. This was the first solid evacuation since the commencement of the fast. There were about 2 oz. of a clear watery evacuation on the twenty-fifth day. During the latter part of the time Jacques suffered more or less from gout, which made its appearance first in the right hand, and

subsequently in the other extremities, but the gout was not so severe as was the case during his former fasts. On one or two occasions he complained of headache, but not of a serious nature. As a rule he slept well, from midnight to 6 or 7 a.m.

During the fast he took small doses, repeated three or four times a day, of a powder made, he said, from herbs which he collects in the fields and woods around Crayford, and it is to this powder that he attributed his capability of existing so long without food. He could not be persuaded to allow this powder to be seen by any one; therefore his statements with regard to it must be taken for what they are worth. The total quantity of powder consumed was four ounces. As to his general condition, it was much the same as Succi's. His tongue was moist, and generally slightly furred. The heart-sounds were regular, and distinctly audible. The pulse varied from 60 to 114, according as he had been resting or moving about, a very little exercise sufficing to increase the rate. Temperature was high on one or two occasions, when the gout was rather severe, the highest being 100·2° F. on the forty-second day; otherwise the variations from normal were insignificant, except on the thirteenth day, when it was as low as 97°. The respirations were generally about thirty per minute. The skin was dry, and comparatively inelastic throughout, and its sensitiveness was unimpaired. The muscular reflexes did not show any noticeable alteration. Hearing and sight were unaltered. Towards the last there was some unsteadiness in walking, but that was probably due more to the painful condition of the right knee and foot than to any actual exhaustion. On the last day his voice was much weaker than usual, and he complained of dryness of the fauces. During the fast the excretion of urea diminished to a minimum of 114 grains per diem, the average for the whole period being 144 grains. His demeanour throughout the whole period of fifty days was very cheerful except when in pain from gout, but even then there was no marked irritability of temper. He smoked cigarettes continually except on one day (the forty-second), when he was advised to desist, the total number consumed by him during the fifty days amounting to nearly 700.

Having accomplished the full period of fifty days at 4 p.m. on September 19th, Jacques partook of some chicken broth, followed by a small piece of sole and a portion of a mutton chop, washed down with Burgundy wine. This meal was digested without any inconvenience, and he afterwards resumed ordinary diet, being only careful as to the quantity taken at each meal (*B. M. J.*, 1891, 2, p. 710).

These records have a certain quasi-scientific interest, but require no further comment here.

SECTION XI.

ASPHYXIAL DEATHS.

DEFINITION OF ASPHYXIA.
SYMPTOMS AND POST-MORTEM APPEARANCES OF SIMPLE ASPHYXIA.
SUB-SECTION A.—DROWNING.
,, B.—HANGING.
,, C.—STRANGULATION.
,, D.—SUFFOCATION.

DEFINITION OF ASPHYXIA.

By custom and general usage in medicine and physiology, the term asphyxia[1] is applied to a condition in which the supply of oxygen to the blood or to the tissues or to both has been reduced below the normal easy-working level, and, in death from asphyxia, has been reduced below the irreducible minimum necessary for the continuation of life. It is seen frequently enough in disease, a point of some little importance in determining the cause of death in a case of doubtful significance; but the forms of violent death—in which connection alone asphyxia is of medico-legal interest—in which it occurs comprise drowning, hanging, strangulation, and suffocation, and sometimes it is apparently the actual cause of death in bodies found in buildings or rooms that have been on fire (*vide* "Cause of Death in Burns").

It is also undoubtedly the cause of death in poisoning by CO and CO_2 and some other "gaseous poisons," *q.v.*

THE SYMPTOMS AND THE POST-MORTEM APPEARANCES OF SIMPLE ASPHYXIA.

These have been carefully studied and noted by physiologists, and are as follows:—The animal at first breathes more rapidly, and possibly more deeply, as the system finds that the supply of oxygen to be obtained by ordinary respiratory movements is inadequate. These excessive movements soon assume such proportions as to deserve the name of convulsions, which are at first both of expiratory and inspiratory character; the expiratory efforts are then seen to assume a preponderance, and this period in turn is replaced by one in which inspiratory efforts are more conspicuous. By this time death is very near, and all respiratory movements soon cease. After respiratory movements have ceased genuine convulsions of a type not calculated to assist respiration

[1] Etymologically asphyxia means pulselessness, and is therefore a particularly unfortunate word to have chosen, inasmuch as in deaths from asphyxia the pulse continues to beat for from three or four, to as long as ten to twelve, minutes after respiratory movements have ceased.

may be observed; these again soon cease, and death then rapidly follows. Between the cessation of respiratory movements and the actual onset of death there occurs a period lasting some minutes (three or four to as much as ten or twelve) during which the heart continues to beat, and during which it is conceivably possible to restore life, but the dividing line between living and dead is then a very narrow one, though in discussing treatment we shall see that we hope for a long time that the line has not been passed. What is, however, of more importance, especially in drowning, is that consciousness is not destroyed instantly when asphyxiation commences, though its retention may be only for a short period.

The post-mortem appearances of asphyxia thus experimentally produced in animals are very striking, provided that the examination be held at once, but with each hour's delay they become less and less marked. They are—

(1) **Externally** a good deal of lividity, especially about the edges of mucous membranes. The eyes are usually prominent; the tongue is in the majority of cases protruded between the teeth, and occasionally bitten owing to convulsive contraction of the jaws. Rigor mortis is slow of onset as a rule, though it may be rapid.

(2) **Internally** (*a*) the blood is found fluid for an unusually long time after death, as it coagulates unduly slowly, owing to the excess of carbonic gas (CO_2) contained in it, and for the same reason it is very dark in colour, almost black in fact. (*b*) The veins of the viscera in general are gorged with this dark-coloured blood, but the meninges, or coverings of the brain, the lungs, and the heart present such diversities in different cases that each must be mentioned separately. *The Lungs.*—If death has occurred slowly (by proper management of the experiment), the lungs are found intensely engorged; if death has occurred very rapidly, the lungs may be quite anæmic, their condition varying inversely with that of the right side of the heart, which in the first case is only moderately distended with blood, but in the latter is so distended as to seem almost on the point of bursting. *The Meninges.*—Patenko has shown that if animals are hung at the end of inspiration the lungs contain but little blood, and the meninges a great deal, while if they are hung at the end of expiration the reverse is the case. Besides these conditions of fulness or the reverse of the venous channels, the only other noteworthy feature is the presence of small petechiæ, or bleedings, in lay parlance, beneath the serous covering of various viscera. Sub-pleural, sub-pericardial, and meningeal bleedings are all moderately common. About them the following facts are recognised: (*a*) they do not always appear when death has most positively taken place from asphyxia; (*b*) they are more likely to appear the more rapidly asphyxia has supervened; (*c*) they are the result of the rupture of capillary bloodvessels or very small venules by excessive pressure of blood; (*d*) in asphyxia, pressure in venules and capillaries is enormously increased. Hence we may legitimately say that when they are present death has almost certainly taken place from asphyxia, provided we have knowledge that the person was not suffering from a disease (such as purpura, scurvy, etc.) in which such petechiæ are to be expected; if they are absent, we have no right to form a strong negative opinion, viz., that death did not take place from asphyxia.

Such is the picture of experimental death from asphyxia, and with it we have to compare the picture presented by the post-mortem appearances found in any case of violent death in which asphyxia may have played a part. It cannot, however, be too strongly insisted upon that these are the appearances presented *immediately* after death, and that they are, in the main, appearances produced by blood still contained in elastic and contractile vessels and organs, all of which undergo alterations in capacity as the result of rigor mortis, with consequent alterations in their naked eye appearance.

Again, the picture itself has variations which are only partly accounted for by the conditions of the experiments. We must, therefore, be cautious in drawing any very hard and fast conclusions as to whether death was or was not the result of asphyxia, and we must allow full weight to other items of evidence which will subsequently be found to exist in all cases of violent asphyxial death of medico-legal interest.

With regard to effusions of blood in asphyxia deaths and their simulation by effusions due to natural causes, *vide* a paper by H. A. Lediard in vol. 79 (1896) of the "Med.-Chir. Trans.," entitled "Ecchymosis from Natural Causes."

SUB-SECTION A.—DROWNING.

CAUSE OF DEATH IN DROWNING.
COURSE OF EVENTS IN AN ORDINARY CASE OF DROWNING.
COURSE OF EVENTS IN EXCEPTIONAL CASES OF ALLEGED DROWNING.
TIME REQUIRED FOR DEATH IN DROWNING.
AFTER HOW LONG IMMERSION IS RESUSCITATION POSSIBLE?
POST-MORTEM APPEARANCES IN THE DROWNED.
WAS DEATH CAUSED BY DROWNING?
HOW LONG HAS THIS BODY BEEN DEAD?
WHEN DOES A BODY FLOAT?
WAS IT ACCIDENT, SUICIDE, OR HOMICIDE?
TREATMENT OF THE APPARENTLY DROWNED.

According to the report of the Registrar-General, the deaths from drowning were in 1901—

	M.	F.	Total.
Accident	2,358	406	2,764
Suicide	405	274	679
Murder	19	11	30

making a grand total of 3473 persons at all ages who met their death by this form of asphyxia.

THE INTIMATE OR ULTIMATE CAUSE OF DEATH IN DROWNING.

From time to time many opinions have been expressed as to the precise manner in which death takes place in drowning. These need not be mentioned, for they scarcely possess even historical interest now that every competent person accepts asphyxia as a satisfactory and complete explanation, *i.e.* an asphyxia produced by the entry into the air-passages and cells of the lungs of an irrespirable medium which effectually prevents aeration of the blood. Asphyxia is induced in drowning owing to a physical impediment to the introduction of air into the lungs. The medium in which the person is immersed acts mechanically, and even more effectually than a rope or ligature round the neck; for although air escapes from the lungs, and water penetrates into the minute air-tubes, yet no air can enter to supply the place of that which has already expended its oxygen on the blood. Hence this fluid must circulate, in the first few minutes after submersion, in a state unfitted for the continued support of life (unaerated); but the person lives, and is for a short time after immersion susceptible of recovery. After the entire suspension of respiration the action of the heart gradually slackens, and finally stops. It is at this period of complete arrest of circulation that asphyxia passes into death.

If the ordinary experiences gained by the examinations of human

bodies which have been drowned were insufficient to prove this view, there are the precise scientific experiments of the Medico-Chirurgical Society to fall back upon (Rep. on Suspended Animation, "Med.-Chir. Trans.," 1862, p. 449). Thus it was found by the committee that *four minutes'* complete submersion in water effectually killed dogs, although after removal from water the heart continued to beat from four to five minutes. The continuance of the heart's action furnishes, therefore, no criterion of the power of recovery.

A submersion of a minute and a half was found sufficient to destroy the life of a dog. After only one minute's submersion—or with a large dog after a submersion for a minute and a quarter—the animal recovered almost immediately on removal from the water. Other experiments showed that in asphyxia from simple privation of air a dog would recover after *four minutes'* suspension of breathing; but, as in drowning a *minute and a half* was sufficient to destroy life without any sign of recovery, it was obvious that some additional cause was at work to render drowning more speedily fatal than simple asphyxia. This was found not to be owing to exhaustion from struggling after the violent efforts made to breathe, nor from the effect of cold in immersing the whole of the body, but to the introduction of water by aspiration into the minute air-tubes and cells of the lungs. Two dogs of the same size were submerged at the same moment, but one had his windpipe plugged, so that neither air nor water could enter, while the other had the windpipe open. After two minutes they were taken out together. The one with the windpipe plugged recovered at once; the other died. In three experiments dogs with their windpipes plugged were kept below the water for *four minutes*. The animals recovered perfectly when removed from the water (Report, p. 459). An inspection of the bodies at once revealed the cause of the difference. In animals simply deprived of air by plugging the windpipe the lungs were merely congested; but in those which were submerged in their ordinary condition the lungs, besides being more congested and showing ecchymosed points on the surface and in the substance, contained in their bronchial tubes a bloody mucous froth, formed of water, blood, and mucus, completely filling the small air-tubes. The respiratory efforts made by the animal before death had caused the production of this froth, which formed a mechanical impediment to the entrance of air by the movements of the chest, as in respiration. The mucous froth or foam issued from the lungs on section, and appeared to penetrate their entire substance, which was saturated with water tinged with blood. The lungs were sodden with water, heavy, soft, and doughy, so that they retained an impression produced by the finger and were incapable of collapsing. In the lungs of animals which recovered after a short submersion, little or none of this mucous froth was found in the air-cells. In the fatal cases the quantity was great in proportion to the time of submersion. There is no doubt that it is produced by the violent efforts to breathe which are made within a minute after submersion.

This report is particularly valuable because the animals could be definitely accepted as having died directly and deliberately from drowning, and it proves conclusively that when such is the case the lungs are always and invariably filled with the menstruum in which drowning takes place.

Accepting the above as facts, it is nevertheless found that many bodies taken out of the water do not present these waterlogged lungs. The explanation of such cases is of the highest medico-legal interest and importance, and will be discussed presently, but we may first note the

COURSE OF EVENTS IN AN ORDINARY CASE OF DROWNING.

When a person in the full possession of his senses and with unfettered limbs commences to drown, he first sinks to a greater or less depth. In falls into the water the momentum of the body will cause it to sink in a similar manner. The buoyancy of the body or of body and clothes will cause the person to rise again even if instinctive efforts at self-preservation are not made, which also have the effect of bringing the body to the surface. On coming to the surface violent attempts to breathe are at first made ; but, while air is received into the lungs, water passes into the mouth, which the drowning person is irresistibly compelled to aspirate. One of two things happens : either the individual can or he cannot swim. In the former case, he pushes along the surface of the water till he is fatigued ; and then he is in the same case as a person who cannot swim. Whether from the outset he is in this predicament, or comes to it from fatigue, he executes irregular movements with arms and legs, seizes everything within his reach, clutches at and lays hold of all objects, whether fixed or in motion, and alternately appears and disappears from the surface of the water. Each time that his head dips beneath the water a portion of this is drawn into the air-tubes and cells of the lungs. The same is observed to occur when the head comes to the surface ; air and water are then inspired ; the latter is partly swallowed, and partly ejected by an involuntary fit of coughing, provoked by the contact of water with the glottis. The efforts at coughing cause the expulsion of air from the lungs, and an imperative desire to breathe is felt ; but, as the head gets only partially out of the water, the result is that more air and water are inhaled. The struggle for life may continue for a longer or shorter period, according to the strength of the person ; but the result is that exhaustion ensues, and the drowning person floats beneath the surface, opens his mouth, endeavours to draw in air, and water only enters. This is expelled from the windpipe, mingled with air ; and it may be that a pint or more enters the stomach. The blood in the lungs becomes imperfectly aerated ; insensibility follows, convulsive movements of the body take place, and the individual sinks to the bottom.

There is a common tradition that a person in the act of drowning rises three times to the surface. It may be that some do so, but there is certainly no reliance to be placed on such belief. That he rises at all is partly due to the fact that the specific gravity of the body is very nearly that of ordinary water, a point to be discussed presently, but more certainly due to the fact that very slight movements only are required to bring the body up, for it is found that when no such efforts at all are made the body may sink once for all on first being immersed. A most graphic account of these phenomena of drowning and of the symptoms is given (on the authority of Dr. Cullen) by a

lady in the *B. M. J.*, vol. 2, 1894, p. 941. She lays special stress on the pain experienced from drawing salt water into the lungs.

EXCEPTIONAL EVENTS IN CASES OF ALLEGED DROWNING.

In the above exposition the primary condition was that the victim should be sensible and have his limbs unfettered at the commencement of drowning. Such a condition invariably leads to the rising of the body with the phenomena of aspiration and some swallowing of water. Some persons, however, who fall into the water sink at once without any such attempts at extrication. Such an event indicates either some degree of unconsciousness or mechanical difficulties in the way of using the limbs. The latter will be discussed later when the question of accident, suicide, or homicide has to be decided; the former may now be considered. We have the following groups of possibilities:—

(*a*) He may have been stunned by the fall into the water or even have been actually killed by this means, or by his body striking some solid object in its fall.

(*b*) He may have been so intoxicated (or otherwise rendered insensible) as to have been unable to help himself.

(*c*) The fright at finding himself in his dangerous position may have caused such a shock as to have actually killed him by sudden stoppage of the heart, especially if this organ be weak or definitely diseased. (A case of this kind is reported in the *Lancet*, 1850, vol. 2, p. 550.)

(*d*) The shock from the sudden application of cold to the skin may equally have caused sudden stoppage of the heart or rapid internal congestion of organs incompatible with continued circulation. [Bodies have been repeatedly taken out of ice-cold water with instantaneous rigor (*vide* "Cadaveric Spasm") well marked, notably in the Regent's Park ice accident some years ago.]

(*e*) Cramp in the muscles of the limbs may have prevented struggles.

(*f*) Such cramps may have spread rapidly to or even started in the respiratory muscles. Brouardel and Loye in *Archiv. de Physiol. et Pathol.*, 1889, have demonstrated by experiment that in drowning there is often a voluntary inhibition of respiration followed by violent compulsory respiratory efforts, and it is possible that such voluntary primary inhibition may in certain cases remain permanently till death ensues.

(*g*) He may have died from some totally independent cause, such as apoplexy, fits, epileptic or otherwise, etc., and his position at the moment of death may have been such as to cause him to fall into the water.

(*h*) He may have been killed and thrown in.

Now in all these conditions the respiratory movements will be either *nil* or feeble; and it is obvious that in the first alternative the signs of asphyxia from water in the lungs will be entirely wanting, and in the latter alternative probably not very marked, or only marked in proportion to the vigor of respiration, and hence the post-mortem appearances will vary; and admitting, as we must, that asphyxia thus

produced is the sole cause of death in drowning, these variations in post-mortem appearances are of the utmost medico-legal importance, for the first question that will arise in the inquiry will be, Did this person come to his death by drowning? It must be at once admitted that, if *all* signs of death from aspiration of the medium are absent, then the cause of the unconsciousness must have been sufficient in itself to kill, if the person was submerged at the time of the occurrence of the cause for the unconsciousness. The matter will be again referred to when we discuss the question of "Did this Person die by Drowning?" (*vide infra*, p. 665).

Devergie ("Méd. Lég.," vol. 2, p. 336) estimates that among one hundred persons who fall into the water, or are exposed to the chances of drowning, the causes of death are—

Asphyxia, pure	25·0	Asphyxia	87·5
,, and syncope	62·5		
,, ,, cerebral congestion			
Syncope, apoplexy, or concussion			12·5
			100·0

From this table we learn that out of one hundred bodies removed dead from water, where death was due either directly or indirectly to immersion, if the body were removed immediately after death and examined soon after removal, the ordinary appearances of drowning would be present in about twenty-five, they would be imperfectly apparent in about sixty-two, and they would be wholly absent in about twelve. For a full examination of the causes of death in drowning by Loeffler see Henke, *Zeitschr. der S. A.*, 1844, 1, 1; also a paper by Ogston, *Med. Gaz.*, vol. 48, p. 291.

The following is a typical case of what is here termed an exceptional case of alleged drowning. The account is furnished by Dr. Greer; it caused some excitement at the time under the heading of "Death of a Parachutist." It runs as follows:—

Report of the case with necropsy on Louisa Maud Evans (Mademoiselle Albertina), aged fourteen years, "the child parachutist," performed July 26th, 1896, by James Hurley, and William Jones Greer, of Newport, Mon.

It was the girl's first ascent. She went up in the balloon from the exhibition grounds in Cardiff. It was stated that she ascended too high, and that, instead of leaving the balloon when it was over the town, she allowed herself to be carried in it over the Channel (Bristol).

When she left the balloon she was seen to descend roughly about 300 feet before the parachute opened. During this descent her body was seen to swing about very loosely. When the parachute opened the speed slowed. She came on down and struck the water "all of a heap," and quickly disappeared, the parachute covering her up. She had a Board of Trade life-belt on. She was fixed to the parachute by clips (similar to a watch-chain clip). The body was found in three or four days, detached from the parachute; the clips were on her shoulders intact.

The body was that of a female fairly well nourished, but not fully developed. Cutis anserina present. No dislocations nor fractures. Discoloration of forehead and between the eyes, large bruise over front part of left side of head above and behind the ear. On the right forearm there was an abrasion on the back. Tongue swollen and indented by the teeth. Mouth and pharynx contained sand and grit. On dissection of vertebral column no fracture nor dislocation discovered. Heart and pericardium apparently normal and healthy. On opening the heart it was found perfectly empty (auricles and ventricles), valves and endocardium healthy. Lungs inflated, diaphragm normal. Very tough pleural adhesions all over left

lung, right lung normal. Trachea contained mud and sand; the smaller tubes contained air, mud, and water mixed. Œsophagus empty. Liver congested. Stomach perfectly empty. There was a small cicatrix on posterior surface near cardiac opening. Hymen present, uterus undeveloped. Brain soft and greatly decomposed.

Dr. Hurley and myself considered that we were justified in coming to the conclusion that the girl was in a state of syncope when she went into the water, and that death was due to drowning.

TIME REQUIRED FOR DEATH IN DROWNING.

A witness may be asked how long a time is required for death to take place by drowning. In giving an answer to this question, cases of death from syncope or apoplexy must be excluded from our consideration. In these circulation and respiration are simultaneously arrested. Some persons who are strong, good swimmers, and retain their presence of mind, may support themselves for a long time in water; while others who are weak, delicate, and unaccustomed to the water, may struggle only for a few seconds, and then sink exhausted. There are three very different points involved in this inquiry: (1) How long can a person remain *beneath* the surface of water without becoming asphyxiated (drowned)? (2) After what period of entire submersion of the body may we hope to resuscitate a person? (3) The question may very seriously arise when medical evidence is required of survivorship when several people are drowned in the same accident. In regard to the first point, it may be observed that usually when the mouth is so covered that air cannot enter asphyxia supervenes in the course of one or two minutes at the farthest, and the time at which this occurs does not appear to vary materially with the person. Perfect insensibility has supervened after a minute's submersion, and it is probable that in most cases a few seconds would suffice for the commencement of asphyxia. In the case of a healthy diver, who was accidentally submerged for *a minute and a half* at Spithead in 1842, at the depth of eighty feet, without the power of breathing, it was observed that when drawn up his face and neck were much swollen and discoloured. He was faint, but sensible, and recovered under treatment. In 1864, a diver descended at Falmouth to about the same depth. From the time of his making the signal to be drawn up *two minutes* only had elapsed before he was taken into the boat. He was then insensible, but he was able to place his hand across his mouth. His face, ears, and nostrils were covered with blood. He did not speak, but gave a convulsive struggle, and died soon afterwards. It was found, as in the previous case, that the pipe supplying air had burst, and that the valve for the outlet of foul air had become fixed. The difference between recovery and death was, in these two cases, represented by the interval of half a minute (*Med. Gaz.*, vol. 31, p. 90). Observations made upon divers, sponge and pearl, show for how short a period a human being, even when practised in the art of diving, can continue without breathing. Lefevre found that among the Navarino sponge-divers, accustomed as they were to the practice of diving, there was not one who could sustain entire submersion of the body for *two consecutive minutes*. The average period of entire submersion was seventy-six seconds (*Med. Gaz.*, vol. 16, p. 608). The longest time which the Arab divers of the Red Sea have been observed

to remain under water was ninety seconds; the average period was seventy-five seconds. The best pearl-divers of Ceylon can rarely sustain a submersion of more than fifty seconds. In 1882, a woman exhibited in London a surprising power of enduring a prolonged sojourn under water without any apparent injurious results. This woman (Lurline) remained completely submerged in a tank of water without breathing for periods of two and a half and even three minutes at a time. Thus then it would appear, from these and other observations, that asphyxia is probably induced in most persons in the course of a few seconds, and that at the farthest it occurs in from a minute to a minute and a half. But asphyxia is not synonymous with death; and while in many persons asphyxia may commence at or about the same period of time, there are probably few in whom, under complete submersion, the circulation would be arrested or death take place at precisely the same instant of time.

AFTER HOW LONG AN IMMERSION MAY RESUSCITATION TAKE PLACE?

This question is of importance in relation to the treatment of the drowned. The insensibility which is the result of submersion will give to a body which has been immersed for only a few seconds or minutes the characters of apparent death; but we are not therefore to suppose that the person is irrecoverably lost, nor to desist from applying all the means in our power to restore animation. On the contrary, the means should be applied without delay even to bodies which have remained so long in water as to afford but little hope of ultimate recovery. Devergie states that it has been found impossible to restore some who had not been entirely submerged for more than a minute even when the bodies were removed with all the warmth and pliancy of life about them; but, on the other hand, persons have been resuscitated who, there was reason to believe, had been entirely submerged for five minutes. Many of the reported recoveries have no doubt been cases of the resuscitation of persons who had not been entirely submerged, *i.e.* whose hands were not entirely below water for the period alleged. In most of the recorded instances of recovery after alleged protracted submersion, the evidence has rested upon the loose statements of ill-informed persons.

Woolley, for many years medical officer to the Royal Humane Society, found in the Society's records only two cases of recovery after five minutes' submersion. In the Report of the Society for 1840 there are two cases of recovery after a minute and a half, and two after three entire minutes' submersion. A boy recovered after from five to ten minutes, and a girl, aged two years, after ten minutes' submersion (*Lancet*, July, 1841). It is not certain whether the head of the child was under water during the whole of this period. A case of recovery occurred after six minutes' alleged submersion (*Med. Gaz.*, vol. 29, p. 78), and in another there was partial recovery after a submersion, it is supposed, of at least eight and probably thirteen minutes. A man is stated to have recovered after having been fourteen minutes under water, but the time was not determined by actual observation

(*ib.*, vol. 31, p. 448). The longest case recorded, with any claim to authenticity, is one in which a woman is stated to have recovered by prompt treatment after a submersion of *twenty minutes* (*Amer. Jour. Med. Sci.*, April 22nd, 1853, p. 348). In the author's experiments it was found that an animal could not be restored after its body had been entirely submerged for a period of four minutes; and in one instance a stout healthy man, who had been submerged five minutes, could not be restored, although he was submitted to treatment very soon after his removal from the water. It has been a general opinion that so long as any spontaneous movement of the heart continues there is a chance of recovery, but this strictly applies to the rhythmical pulsations, and not to the mere convulsive movements of the organ. Brodie states, as the result of his observations on animals, that the rhythmical pulsations cease in from four to four and a half minutes after submersion, and that no animal recovered after these had once ceased, although some convulsive movements of the heart manifested themselves for a longer period ("Med.-Chir. Trans.," 1861, vol. 44, p. 149). These facts lead to the conclusions that in drowning life is very rapidly destroyed; that the time within which a person may be resuscitated is subject to variation, but that after five minutes' complete submersion there can be little hope of success by any method of treatment, and even then our efforts would probably fail unless the treatment were commenced immediately on the removal of the body from water.

These statements are in very general agreement with the results obtained by the committee of the Medico-Chirurgical Society (*vide ante*), and from this evidence we may conclude that the power of recovery in human beings is in inverse proportion to the amount of mucous froth in the air-tubes and to the penetration of the substance of the lung with water, and, speaking generally, this amount and penetration as well as the degree of sub-pleural ecchymosis is proportional to the efforts made at self-preservation.

Hence it is that a state of syncope is favourable to recovery, as in this condition there are no violent efforts at respiration when the head is below the surface of the water. In one case, a girl recovered after having been six minutes under water; but it appeared in evidence that she had fallen into the water in a state of syncope ("Med.-Chir. Trans.," 1861, p. 149).

There can, however, be no question but that the earlier or more loosely recorded cases of recovery after submersion for more than say seven to eight minutes involve a fallacy somewhere, which to the editor seems probably to consist in some air being available for respiration, drawn down in the clothes or hair of a woman or in the sail of an overturned boat, etc. Such a case actually occurred to him once, a little dog remained for twenty minutes under—*i.e.*, in the overturned position, over—the seat of an upset boat. There was, of course, no question of drowning, as the dog was none the worse for its temporary imprisonment, but it illustrates the possibilities of the position. In the *Lancet* for 1881, a case of total submersion for twelve to fifteen minutes, followed by eventual recovery, is reported. Either syncope or included air must be invoked to account for such a favourable result.

POST-MORTEM APPEARANCES IN THE DROWNED.

In conducting the examination of the body of a drowned person, it is necessary to remember that the external and internal appearances vary much, according to the length of time during which the body has remained in water or the period that has elapsed after its removal and before it is examined. Thus in reference to the bodies of two persons drowned by a common accident, if one is examined immediately, and the other is not removed from the water until after the lapse of several days, and is then inspected, the appearances will be different. So if two bodies are removed at the same time, and one is immediately examined, while the other is not inspected until a month after removal, the proofs of drowning which may be discoverable in the former will have disappeared in the latter.

It is impossible to lay too much stress on the necessity for examining *as soon as possible* a body taken out of the water. The rapidity with which putrefactive changes come on in bodies taken from the water, and the rapidity with which some of the most essential signs of asphyxia from the aspiration of water may disappear are very extraordinary. Bearing this caution in mind, however, we may proceed to discuss things from a practical point of view.

External Appearances.

Supposing that the body has remained in the water only a few hours after death, and the inspection has taken place immediately on its removal, the *skin* will be found cold and pallid, sometimes contracted, under the form of "cutis anserina," or goose-skin. Casper considers this to be a usual accompaniment of death from drowning. A contracted state of the skin when found certainly furnishes strong evidence of the body having gone into the water living; but this condition is met with after death from any sudden shock, *e.g.*, after death from hanging. The skin is often covered to a greater or less extent by livid discolorations. The face is pale and calm, with a placid expression; the eyes are half open, the eyelids livid, and the pupils dilated, the mouth closed or half open, the tongue swollen and congested, frequently pushed forwards to the inner surface of the lips, sometimes indented or even lacerated by the teeth; and the lips and nostrils are covered with a watery mucous froth which oozes from them. Kanzler has noticed in the male subject a remarkable contraction of the penis. In men who have gone living into the water and been drowned, this appearance has been repeatedly observed by Casper and Kanzler; and the former states that he has not met with this condition of the male organ after any other form of death. In the bodies of strong and robust men it was found short and strongly retracted ("Ger. Leich.-Oeffn.," 2, 109). No deduction as to death from drowning can, however, be made from the condition of the penis. Ogston states that he has more than once seen it in a condition of erection or semi-erection, and certainly, if we consider the mechanism by which erection or the reverse is brought about, there can be no difficulty in accepting either condition as perfectly compatible with drowning or death from any other cause.

The sodden and wrinkled skin ("washerwoman's hands") is purely

and simply the result of the skin remaining for some time in water, and has no possible bearing on how death occurred, though it may be important in enabling us to state approximately how long the body had lain in water (*vide* "Decomposition in Air and Water," with reference to this and the changes of putrefaction).

The body and limbs of a person recently drowned are usually found relaxed; but cadaveric rigidity appears to come on quickly, and the body is often stiffened in the convulsive or distorted attitude which it may have had at the time of death (*vide* "Instantaneous Rigidity"). A medico-legal question may arise in reference to this condition of the dead body (*Reg.* v. *George*, Hereford Lent Ass., 1847). In one case, the body of a man who was drowned under ice was found with the arms stiffened in the attitude in which he was endeavouring to support himself on the ice. In the accident which occurred on the ice in the Regent's Park in January, 1867, by which a large number of persons were at once precipitated into ice-cold water, it was observed that among thirty-four dead bodies brought to the Marylebone Infirmary many of them had become stiffened in the attitude of active exertion, the hand and arm thrown forward, as if skating or sliding. The muscles remained rigid for forty-eight hours. Those who were brought in living were in a state of violent excitement. Some were delirious, and others staggered about like drunken persons. The faces were flushed, and the pupils dilated. These were suffering from shock as a result of the cold immersion (cold stroke) and of the fright of the accident.

Amongst external appearances must be noted abrasions on the fingers and feet and perhaps elsewhere on the body. Such are easily explicable by the fact that in the act of drowning a person will grasp at any object within reach, and in his efforts to extricate himself may easily excoriate his fingers or even tear them badly, especially the nails, in trying to get a grip on a hard body too large for the grasp of the hand. Precisely the same explanation will account for the presence of gravel, sand, mud, weeds, or any substance found locked within the hands or beneath the nails, and their exact nature it is most important to notice (*vide* later). Substances floating in the water are sometimes found in nose, mouth, or ears. The presence of all these things is of much more importance as evidence, than their absence, for it is quite obvious that there may be, especially in deep water, or in bodies of water with brick, or cemented, or smooth but hard enclosing boundaries, or in many other circumstances, nothing for the drowning person to grasp. Again, if he were senseless before or on falling in, or in a state of syncope, he would not be in a position to make the exertion which is necessary to the production of such appearances, and it is very probable that this frequently happens.

Internal Appearances.

On examining the body of a recently drowned subject the lungs and heart present the appearances usually indicative of asphyxia. The venous system is generally gorged with dark-coloured liquid blood. If death has not taken place from asphyxia, or if the body has remained a long time in water before an inspection is made, the lungs and heart.

will not present the characters about to be described. Some physiologists have asserted that the blood remains fluid in the bodies of the drowned. Orfila has stated that, with one exception, he had not met with blood in a coagulated state. Much more importance has been attached to this appearance than it really merits. Some observers have found the blood coagulated in the drowned; and coagula, like those usually met with after death, are found in the bodies of animals drowned for the sake of experiment. Riedell found the blood in the heart and large vessels to contain coagula in inspections made from two hours to five days after death (*Med. Gaz.*, vol. 46, p. 478). The state of the blood in the drowned formed a subject of inquiry in *Reg. v. Barker and others* (York Wint. Ass., 1846). From the remarks above made it will be perceived that it may be found either coagulated or uncoagulated in those who go into the water living and die by drowning.

Riedell commonly found the epiglottis raised. **The lungs** are more or less congested, and oftener distended than collapsed. Casper and Kanzler found them, as a rule, much increased in volume, and completely filling the cavity of the chest, so that when the chest was opened they protruded out of it. This did not depend on mere congestion or fulness of blood. Casper states that he met with a similarly inflated condition of the lungs in cases in which death had been caused by poisonous gases ("Klin. Novellen," 1863, p. 543; and "Ger. Leich.-Oeffn.," vol. 2, p. 112). Observations in cases of drowning show that the lungs are distended, in a flabby condition, and that, owing to the penetration of their substance by water, they have lost their usual elasticity. Hence an impression made upon them by a finger is preserved. A similar preservation of a finger impression is also seen in emphysema, but here dryness of the lung is a marked feature. Riedell long ago pointed out this flabby and dilated condition of the lungs as a special characteristic of drowning. Owing to their structure being penetrated by water, he found that, although they floated, they were three or four times as heavy as in their natural state (*Med. Gaz.*, vol. 46, p. 478). The lungs are usually in the condition of imperfect expiration, and, from the large quantity of fluid in them, the chest does not readily collapse. The observations of Riedell on the state of the lungs in the drowned have since been confirmed by the experiments of the committee of the Medico-Chirurgical Society. On making a section of any part of the lungs a bloody, frothy liquid escapes, air and water being mixed together in the air-cells. The appearances above described are only likely to be observed in a well-marked form when the body is examined soon after death. The *windpipe*, *bronchi*, and minute *air-tubes* of the lungs, in a recently drowned subject, are filled more or less with a *watery mucous froth*, tinged with blood, as a result of the last violent efforts at respiration when the mouth has sunk below the level of water. This appearance is not always met with. Thus it is stated not to have been found in the bodies of those who have sunk at once below the surface, and have not again risen to breathe. But, from experiments on animals made by a committee of the Medico-Chirurgical Society, its presence in the air-passages does not depend on the fact of a person rising to the surface, although this may increase the quantity,

but rather upon the violent spasmodic efforts made to breathe under circumstances in which water alone can enter the lungs. A dog was kept entirely under water for three minutes and a quarter. It made the usual convulsive efforts to breathe while in the water, but not after removal from it, as the animal was then dead. A bloody froth escaped from its mouth, and on inspection its lungs were found to be filled with this froth. Another dog was submerged for a minute and a half. When removed it opened its mouth, but was unable to make any respiration: it was dead. A large quantity of bloody froth was found in the air-tubes and lungs. A dog was kept with its head below water for one minute, and it recovered when withdrawn from the water. An hour afterwards it was inspected, and there was but little froth in the lungs. These facts show that the froth is produced, even in two minutes, when there is entire submersion of the head; and its quantity appears to be in proportion to the length of submersion and the violence of the efforts made to breathe.

This presence of watery mucous froth in the air-passages may be regarded as the particular characteristic of asphyxia from drowning, and when discovered in any large quantity it furnishes a satisfactory proof of this mode of death. The exact method by which it is produced has, however, given rise to considerable discussion. On the one hand, it is maintained by some that it is simply aspirated water mixed with air, while others take the view that it is largely composed of mucus and air. Mucus is a product of the lining membrane of the air-passages, and its secretion is a vital act. Hence we can easily understand that the longer life has continued, and the fiercer the struggle for it, the more likely there is to be a considerable proportion of mucus in the froth, and also the more likely to be increased absorption of water. This view is distinctly in accord with the results of experimental drownings, and is probably correct. (A full discussion may be found in *Paltauf ueber den Tod durch Ertrinken* (1888) and "Atlas der Ger. Med." (1891).) From a medico-legal point of view this is a matter of no interest beyond the suggestion that little froth means rapid death, and *vice versâ*, which might conceivably be a point in estimating survivorship.

In some cases the contents of the stomach may be found in the windpipe and lungs; this is apt to occur when a person has been drowned with a full stomach. Vomiting has taken place, and the vomited matters have been drawn into the lungs by attempts to breathe during the act of vomiting. For further particulars of such cases *vide* "Suffocation."

The sub-pleural hæmorrhages (petechiæ) noticed under the heading of asphyxia are comparatively seldom observed in drowning, but when present they offer strong corroborative evidence of this form of death.

The Heart.—In Foster's "Physiology" will be found a full description of the condition of the heart in death from asphyxia, but it cannot be too strongly insisted upon that the picture varies very materially according to the time after death that the inspection of the organ is made. As a matter of fact, the heart in the bodies of human beings that have been drowned has been found in every variation of fulness and emptiness on the two sides: both full, both empty, right full and left empty, and both equally full. Hence as evidence of the kind of

death its condition is quite valueless. Why this should be so is not far to seek. In the first place, the heart continues to beat some time after respiration has ceased, and therefore the condition might on this ground be simply that found in any form of death, and this is notoriously variable in the highest degree; in the second place, we must remember that rigor mortis, occurs in the heart, as in any other muscle, and the contraction of rigor mortis may be capable of emptying the chambers and keeping them empty provided that the blood is still fluid when rigor mortis sets in. That the right ventricle is much weaker than the left would easily account for the fact that, though both may be empty, the right never contains less blood than the left.

The Brain.—A greater or less fulness of the vessels of the *brain* is described as one of the appearances met with in drowning; but this, when it exists, is probably a consequence of the difficulties in circulation of the blood. It is evident that the state of the cerebral vessels can afford no presumption that death has taken place by drowning. In the author's experience the quantity of blood contained within the cerebral vessels was rarely so great as to call for particular notice.

Some have gone so far as to ascribe death in drowning to a congested state of the vessels of the brain—that death takes place in most cases by a species of apoplexy; but mere fulness of the cerebral vessels is certainly of itself insufficient to justify this view, for upon the same evidence we might pronounce three-fourths of those deaths which are distinctly referable to other causes to be dependent on apoplexy. The obstruction to the passage of the blood through the lungs is sufficient to explain why we meet with congestion in the vessels of the brain in drowned bodies; but this congestion probably occurs after the interruption of the cerebral functions. The most characteristic appearance of apoplexy, extravasation of blood on the brain, is rarely seen in the drowned; and probably, when it exists, it may be traced to mechanical violence before submersion, or to the head having come in contact with hard bodies beneath the water. Three instances are recorded in which effusion of blood on the brain was found: one was in the case of Leopold, Duke of Brunswick, who was drowned in the Oder (see Henke, "Gerichtl. Med.," p. 327); the second was in a case which occurred in London in 1839; and the third is reported by Casper. A man was drowned in a marsh. There were the usual post-mortem appearances: the membranes of the brain were strongly congested, and blood was effused to the extent of an inch beneath the outer membrane (dura mater). In his experiments on animals, Riedell did not meet with effusion of blood in a single instance (*Med. Gaz.*, vol. 46, p. 478).

The Stomach.—In examining the abdomen, it will commonly be found that the *stomach* contains water, which appears to enter into this organ by the act of swallowing during the struggle for life. This may be salt or fresh, according to the medium in which the drowning has taken place. The quantity is subject to great variation: sometimes it is large, at other times small, and in some instances no water whatever is found. The absence of water may probably indicate a rapid death, as there could have been no power to swallow. Orfila has remarked that the mucous membrane of the stomach and bowels is occasionally much discoloured in drowned subjects. He observed also that when drowning took place while the process of digestion was going on the mucous

membrane of the stomach often had a pinkish, red, or violet tint. This has, however, nothing to do with the mode of death; it is simply a question of the stomach being in active work at the time of death; it is very often seen in ordinary post-mortem work. When the dead body had remained a long time in water, this membrane was observed to acquire a deep violet or brown colour.

Dixon Mann ("For. Med.," 1st ed., p. 222) quotes many references to recent observations on the condition of the stomach in the drowned. The main result is that stated above. He also quotes *in extenso* some experiments carried out by Obolonsky in order to show whether water could or could not enter the stomach after death. This experimenter determined definitely that such entrance was possible, but was extremely improbable under the ordinary conditions of drowning (*vide infra*). It is, however, very important to note not only the actual quantity, but the quality, of any water found in the stomach, *i.e.*, weeds, mud, etc., contained in it (*vide infra* "Was Death due to Drowning").

The Blood itself.—In all deaths from asphyxia, except in poisoning by CO and a few other gases (*q.v.*), the blood is very dark and generally fluid. The darkness is easily accounted for by the absorption of all available oxygen, and consequent reduction of the hæmoglobin to an unoxidised form. The fluidity is promoted also by this want of oxygen, but in drowning there is another factor to be taken into account, viz., absorption of water into the blood from the lungs, and possibly also from the stomach. It is common knowledge in physiology that small quantities of added water promote coagulation of the blood, while larger quantities delay it. Hence theoretically, if death have been slow, with much aspiration and swallowing of water, coagulation may be delayed, and more on the left side of the heart and in the portal vein than elsewhere. If, on the contrary, death have been rapid, with little or no aspiration and swallowing of water, coagulation is possibly more rapid than in simple asphyxia. The point is, however, of no practical importance, for the blood has been noticed either solid or liquid under what seemed similar conditions. More commonly in human pathology with delay in performing the post-mortem the blood is found liquid owing to the liquefaction of decomposition.

There are no other post-mortem appearances than those mentioned which have any special interest in a case of drowning, but this is no excuse for not observing the exact condition of every organ, which is, indeed, or may be, of the last degree of importance in answering our next question, Was death due to drowning? A very typical case of this importance occurred to the editor some years ago at the London Hospital.

A small boy, about five years of age, was ordered to be placed in a warm bath for some little time. The nurse, who was holding him, was unfortunately called away. She was not absent more than two or three minutes, and on her return found the child beneath the water quite dead. Post-mortem examination showed no trace of water in lungs or stomach. The condition of the blood and brain was absolutely natural. It was only on examining the left kidney that the cause of death from shock was explained. There was found a large calculus which had shifted from the renal substance and suddenly blocked the ureter, no doubt causing such agony that the child had died there and then from the shock of it. The editor was thus able to exonerate the nurse from blame and spare her from a lifelong regret.

For a very full report, with several cases, on the appearances in the drowned, *vide* Harvey Littlejohn in *Edin. Med. Jour.*, February, 1903.

Was Death caused by Drowning?

For a correct solution of this question it will be necessary to consider how far the appearances met with in the drowned are pathognomonic of this form of death. Among the *external* signs of drowning when the body is seen soon after death are paleness of the surface, a contracted state of the skin (cutis anserina), and the presence of watery mucous froth about the nostrils and lips. The absence of these appearances, however, would not prove that the person had not been drowned; for if the body had remained some time in water, or if it had been long exposed to air before it is seen by a medical man, the skin may have undergone various changes in its condition and colour, and froth may no longer be found adhering to the nostrils and lips.

State of the Skin.—The goose-skin, or cutis anserina, which is frequently observed in the drowned, shows that the skin possessed the living power of contractility at the time of immersion (*vide* "Somatic *v.* Local Death"). Wagner suggests that the appearance might be produced in a dead body if thrown into cold water immediately after death, *i.e.*, while the skin is warm. As none but assassins would be likely to resort to this proceeding, the objection would, if admitted, leave the fact of drowning still to be made out by an internal inspection. This contracted condition of the skin could hardly be mistaken for a naturally rough or horny skin, as suggested by Casper ("Ger. Leich.-Oeffn.," vol. 1, p. 89). As this condition of the skin is not invariably present, even in the recently drowned, its absence must not be taken to negative the hypothesis of drowning.

Substances Grasped in the Hands.—In speaking of the *external* appearances of the body, it was stated that foreign substances are sometimes found locked within the hands, or lodged under the nails of drowned subjects. This fact may occasionally afford strong circumstantial evidence of the manner in which a person has died. If materials are found grasped within the hands of the deceased which have evidently been torn from the banks of a canal or river, or from the bottom of the water in which the body is found, we have strong presumptive evidence that the person died in the water; for although it is possible to imagine that the deceased may have struggled on the bank, and have been killed prior to submersion, yet in the value attached to this sign we are assuming that there are neither marks of violence on the person nor any appearances about the body sufficiently striking to lead the examiner to suspect that death had occurred in any other way than by drowning. If the substance locked within the fingers or finger-nails is sand of the same character as that at the bottom of the river or pond, or portions of weeds there growing, it is difficult to conceive any stronger evidence to establish the fact of death having taken place subsequently to submersion. The abrasion of the fingers is a circumstance of minor importance: no value could be attached to this state of the fingers as an indication of a person having perished by drowning, unless it were in conjunction with the appearances above described. A witness would be constrained to admit in many cases that the fingers might become abraded or excoriated after death, or even before

submersion; while in no case could he be called upon to make, in regard to substances found grasped within the hands, an admission which would invalidate the evidence deducible from this condition. This must be regarded as a satisfactory proof of a person having been alive after his body was in the water. It is well known that when two or three persons are drowned by the same accident they are not infrequently found clasped within each other's arms—a fact which at once proves that they must have been living when submerged. So if a dead body is discovered still holding to a rope, cable, or oar, no further evidence is required to show that the deceased must have died from drowning, provided that there is no other evidence forthcoming as to a quarrel while still on board, with possible death before falling into the water and instantaneous rigor. Thus in most ordinary accidents while on the water the evidence is conclusive. Such instantaneous rigor, with contraction of hands and feet, lasting till putrefaction steps in, is perhaps more common in drowning than in any other form of violent death met with in civil life, military records being excepted, where such rigor would appear to be very common indeed.

The internal appearances upon which medical jurists chiefly rely as proofs of death from drowning are—first, water in the stomach; and secondly, water with a mucous froth in the air-passages and lungs.

Water in the Stomach.—Riedell found that in the majority of cases of drowning water passed into the stomach. In animals previously killed, and placed for twenty-four hours in water with the mouth wide open, no fluid penetrated into the stomach (*Med. Gaz.*, vol. 46, p. 478). Water commonly passes into the stomach of a living animal while drowning as a result of the act of swallowing. It has been observed that when an animal is stunned prior to submersion water does not pass into the gullet, and when syncope occurs none will be found. As a proof that its entrance into this organ depends on the act of swallowing, it may be stated that the quantity in the stomach is greater when an animal is allowed to come frequently to the surface and respire than when it is maintained altogether below the surface. The power of swallowing is immediately suspended on the occurrence of asphyxia, and in this way we may satisfactorily account for the difference observed in the two cases. The water thus found is in variable quantity; and there are some cases of drowning in which water is *not* present in the stomach. It was found by Ogston in five cases out of seven (*Edin. Med. and Surg. Jour.*, January, 1837, p. 54). In dissecting cats which had been drowned the author repeatedly remarked the absence of water from the stomach. In these instances the animals had been invariably kept under water from the first moment of their submersion, and were thus in a condition but little favourable to the power of swallowing. Water does not readily penetrate into the stomach of a body which has been thrown in after death, the sides of the gullet being too closely contracted to allow of the passage of fluid. If putrefaction is advanced it is possible that some water may enter, but a medical man may easily judge from the general state of the body how far this process may have been concerned in the admission of fluid into the stomach and intestines. Orfila has suggested that water may be found in the stomach of a person apparently drowned in consequence

of this liquid having been drunk by the deceased or artificially injected by another into the stomach after death. It is difficult to conceive under what circumstances the latter objection could be made, or what purpose it would answer. In relying upon the presence of water in the stomach, it may be admitted that the deceased may have drunk water before his body was submerged. The body of a child, aged two years, was taken out of a piece of water and inspected. The usual appearances of drowning, with one exception, were absent. There was no congestion in the brain or lungs, there was emptiness of the cavities of the heart, no water in the air-passages, and thus a want of evidence of death from apoplexy or suffocation. The blood was of a clear red colour, and very fluid; the stomach was almost filled with water, in which some food floated. No cause of violent death was apparent on inspection. The presence of water in the stomach was explained by the fact that the child had been playing with its nurse on the banks of the stream. It complained of intense thirst, and the nurse gave it a copious draught of water. Almost immediately after this, the nurse having walked away, the child must have fallen from the bank into the water (Casper, "Ger. Leich.-Oeffn.," vol. 1, p. 91). The discovery of water in the stomach, except under circumstances to be presently mentioned, is not, therefore, a necessary proof that it has been swallowed during the act of drowning.

It is of course presumed that the liquid contained within the stomach is of the same nature as that in which the body is immersed, for it is possible that fresh water may be found in the stomach of a person drowned in salt water. If the water contain mud, straw, duckweed, moss, diatoms, or any substances like those existing in the pond or river where the drowning occurred, this is a proof, when the inspection is recent, of its having been swallowed by a living person. In the case of Mary Ashford (*Reg.* v. *Thornton*, Warwick Sum. Ass., 1817), some duckweed, with about half a pint of water, was found in the stomach of the deceased. The body was discovered in a pond in which duckweed was growing. This fact sufficed to prove that the deceased must have been living when immersed. In 1843 the body of a young woman was found in the Medway under circumstances that led to a strong suspicion of murder. The medical witness deposed that there were no marks of extreme violence, nor any sign of the deceased having struggled with the supposed murderers. There was some long grass at the back of the mouth and in the throat. The grass was not the same as that growing on the banks of the river, but such as grew at the bottom, which the deceased had probably swallowed after having gone living into the water. On this evidence the accused was discharged. A case in which the question of death by drowning was answered affirmatively under similar circumstances is reported by Rawitz (Casper's *Vierteljahrsschr.*, 1865, 1, 59). The body was found in a pond with injuries on the head. It was obvious from the appearances that the deceased had had the power of swallowing after immersion in the water. In one case (*Reg.* v. *Carnt*, Bury St. Edmunds Lent Ass., 1851, p. 23), the body of deceased was found with her head among water weeds, some of which were discovered in her throat, and the finger-nails were filled with sand and mud, as if clutched convulsively. These facts aided in proving that deceased had died from drowning.

The absence of water from the stomach cannot, however, lead to the inference that the person had not died from drowning, because in some instances it is not swallowed, and in others it may drain away and be lost after death before an inspection is made.

Hence, as a final summary of the import of water in the stomach, it may definitely be said (1) that a *large* quantity of water of the same nature as that in which the body is found is strong presumptive evidence of immersion during conscious life, and therefore of death from drowning; (2) that small quantities give no very certain indication unless the inspection is made very shortly after death; (3) that the quality—*i.e.*, dissolved and above all suspended matters—is of much more importance than the quantity.

Water with Mucous Froth in the Larger Air-passages.—If the body is removed from the water with care, and is examined at a sufficiently early period, these appearances will furnish satisfactory evidence of death from drowning. The mucous watery froth is generally tinged with blood; its mode of production has been described above, and other conditions have been pointed out in which such an appearance may be produced. Riedell regards it as a constant sign of death by drowning. In all his experiments and observations he states that he found a frothy fluid in the windpipe, bronchi, and lungs. After death it gradually disappeared from the larger air-tubes, but not from the lungs. The mobility of this froth is, he contends, a distinctive character of death by drowning, and is not met with in any other form of death (*Med. Gaz.*, vol. 46, p. 478). The presence of a frothy fluid would undoubtedly show that liquid, from some cause, had penetrated into the air-passages; and when taken in conjunction with the presence of water in the substance of the lungs, it may be considered to furnish conclusive evidence of death from drowning. On the other hand, its absence does not necessarily prove that a person has not died from this cause. A mucous froth may not be found when the body has remained for a long period in the water after death, since by the free passage of this fluid into and out of the air-tubes, the froth, although formed in the first instance, may have disappeared. If, after removal from the water, the body is exposed to the air for several days before it is examined, it is rare for this appearance to be seen. The mucous froth may have been formed in the windpipe, but it may have entirely disappeared, owing to the incautious manner in which the body has been handled on its removal from water. Thus, if removed with the head depending, any liquid which may be contained within the lungs will escape, and in passing through the air-passages will remove the froth.

In the editor's opinion the presence of a white mucous froth bubbling up the trachea and issuing from the mouth cannot be taken as in any sense a sign of death from drowning, as he has noticed it as the commonest condition in many hundreds of bodies examined in the post-mortem room at the London Hospital. This, of course, is a very different matter to blood-stained froth in large quantities in the finer tubes and spongy substance of the lungs. Devergie has also noted this, as the following case shows:—

A man died suddenly in Paris, and the body was soon afterwards

taken to the Morgue. It there underwent a minute examination, but there were no marks of violence externally, nor were there any appearances of disease internally to account for death. In the course of the inspection it was found that the larynx, windpipe, and air-tubes contained a mucous froth. In the larynx this was white, but it had a red colour in the air-tubes. Devergie states that it only differed from the froth as it exists in the drowned, in the circumstance of its being in large vesicles, but he owns that, had he not been certain of the contrary, he should have presumed that he was examining the body of a person who had died by drowning. He offers no suggestion as to the cause of this appearance. There was almost a pint of water in the stomach, and the lungs were gorged with blood, as in cases of asphyxia.

Water and Foreign Substances in the Lungs.—It has been stated (*ante*) that in the act of drowning, water is drawn with considerable force into the lungs by violent attempts at inspiration. The aspiratory force thus exerted by the lungs is considerable. It has been found that when the heads of animals were plunged below mercury, some of this fluid metal, in spite of its great density, was actually drawn into the lungs, and globules of it were seen in the air-cells. *A fortiori*, this takes place in a greater degree with water which is forcibly drawn into, and permeates, the spongy texture of the lungs, rendering death more rapid and recovery more difficult than in other forms of asphyxia. This aspiratory force of the lungs has been measured, and is found, in small animals, to be equal to raising a column of mercury four inches in height. Not only is water thus drawn in, but sand, mud, weeds, or other substances floating in it, are also carried into the air-tubes and cells of the lungs. When the water is mixed with weeds or mud, and water presenting the same admixture is found in the throat and stomach, this is strong evidence that the body has been plunged into the medium when the power of breathing and swallowing still existed, and hence that the deceased has been drowned. Attention to the condition of the stomach and lungs together, will therefore be of importance in cases of child-murder by drowning, since it may aid in proving or disproving the charge. In a case tried at the Central Criminal Court, April, 1861, some greenish-coloured mud was found in the throat, lungs, and stomach of an infant whose body had been removed from a pond. The prisoner was acquitted, chiefly on the suggestion that she might have thrown the body of her child into the water when she believed it to be dead, and one or two gasps might have accounted for the appearance presented by the stomach and lungs. When a dead body is thrown into the water, and has remained there some time, water, fine particles of sand, mud, weeds, etc., may pass through the windpipe into the air-tubes. Water under these circumstances, however, does not penetrate into the substance of the lungs as by aspiration during life, and the amount which passes through the chink of the glottis is small. If simply an after-death effect, the water is found only in the larger air-tubes unaccompanied by mucous froth. In most cases, however, the effect of aspiration, as a result of living power, is so manifest, that the examiner can have no difficulty in forming an opinion. There seems to be no evidence of an experimental kind to show that under any circumstances, even those of advanced decomposition, water with suspended matters can penetrate

even to the larger air-tubes in anything more than the very smallest quantity, unless aspirated thereto by respiratory efforts during life, and *a fortiori* none that such matters can penetrate to the spongy lung substance without similar aspiration.

As in the case of the stomach, so with the lungs, it is the quality or nature of the suspended matters that is of most critical importance, of which the following case is an excellent example.

Chevers was required to examine the body of a child found dead in a tank at a distance from the house of its parents. The internal appearances showed that the child had died from drowning. The air-passages contained green vegetable-matter, and the right air-tube was almost completely filled with so large a portion of an aquatic weed doubled together, that it appeared astonishing how such a body could have passed into the windpipe. It was proved that no weed of this kind was growing in the tank in which the dead body was found; and further inquiry led to the discovery, that the body of the boy had been found by a woman in a tank near his home, in which a weed like that taken from the air-passages grew abundantly. She had conveyed the corpse to the more distant tank, which belonged to a person against whom she bore a grudge ("Med. Jurispr. for India," 1856, p. 351). The only reasonable explanation of the facts was, that the child must have been living when placed in the tank in which the weed grew, and have drawn it in by its efforts to breathe. Its presence indicated a living act, and that the body was not put after death into the water of the first tank, but when dead it was subsequently carried to the second tank, and placed there for a malicious purpose.

SUMMARY OF SIGNS OF DROWNING.

F. Ogston, jun. (*Ed. Med. Jour.*, 1882, 1, p. 865), summarises the characteristic signs of drowning as follows. 1. When abundance of water pours from the mouth on turning the corpse face downwards, and if white watery froth be found at the mouth and nostrils, or if it may be made to issue from them on compressing the chest, we may be justified in giving an opinion as to the probability of drowning, especially when the accessory signs, viz. rosy redness of the face and front of the chest, goose-skin, and bleaching and corrugation of the hands, are well marked; presuming always that no lethal injuries are seen on the body, which would appear to have been inflicted before death, and no traces of corrosive action, etc., from poisons be observable about the lips, hands, clothes, etc.; but to justify us in giving a more positive opinion, we ought to have furnished to us a detailed account of the locality in which, and the circumstances under which, the body was observed before its removal to the place where it lies for examination. 2. Where a complete inspection of the body is permitted, we may give a more positive opinion when, in addition to the external appearances, water in marked quantity, mixed with white watery froth, is found in the lungs and stomach, and also, perhaps, when a large quantity of watery fluid is seen in the pleural cavities; when sand, sea-weed, etc., is found in the bronchi, or even in the windpipe; when the lungs are bulky or protrude on the removal of the sternum; and when the blood within the heart

is wholly fluid—especially when with these signs we find marked appearances of asphyxia in the heart, lungs, liver, etc.

Early inspection of the body may enable a medical man to come to a satisfactory conclusion that death was or was not caused by drowning. The longer this inspection is delayed, the more ambiguous the evidence becomes, since the froth rapidly disappears from the air-tubes, while water may not be found in the lungs and stomach. The great cause of failure in obtaining medical proofs of drowning is generally the unavoidable delay before an inspection is made. After the lapse of five or six weeks, especially if the body has been removed from the water for the greater part of that period, none of the usual appearances of drowning will be met with: in the present day, no practitioner would think of seeking for evidence under such circumstances.

The two following cases illustrate the contention very well:—

In an inquest on the body of Edward South, held at Lynn in March, 1871, it appeared that it had been three weeks in the water. One medical witness said that from the presence of water in the stomach, and the fluidity of the blood, his opinion was that the deceased had died from drowning. Another contended that from the lungs being found in a collapsed state, death had not taken place from drowning. The jury could therefore come to no satisfactory verdict.

The proper course in such a case would have been to state that the changes which had taken place after death had rendered it impossible to form a correct opinion.

The difficulties which arose in Kirwan's case (*Reg.* v. *Kirwan*, Dublin Commis. Court, 1853), depended in a great measure on the length of time which had elapsed before the body of the deceased woman was inspected. On the day following its removal from the water, the body was superficially examined *externally*. Thirty-one days after death, and twenty-six days after burial, it was exhumed, and a proper inspection made. The lungs were found engorged with blood; the heart empty; the stomach empty and contracted. The absence of the usual appearances found in recent cases of drowning was considered by some of the witnesses to prove that the woman had *not* died from drowning; therefore that she had died from some other cause, and her body afterwards placed in the water.

Considered apart from the moral evidence, the inspection of the body threw no light whatever upon the cause of death. Medical evidence based upon appearances so long after death is untrustworthy.

On the other hand the two following cases are very typical examples of what constitutes evidence from drowning in cases examined within a reasonable time.

A woman's body had been in the water about an hour and a half. The inspection was made twenty-four hours after death. The contracted state of the skin (cutis anserina, or goose skin) was well marked. The vessels of the membranes of the brain were somewhat congested, the principal seat of congestion being at the base. The tongue was neither swollen nor indented, but pallid. Mucous froth in considerable quantity was found in the windpipe: the vesicles were exceedingly minute in the upper part, but at the lower portion of the tube they were as large as a mustard-seed. A small quantity of clear fluid flowed through the bronchial tubes when the lungs were raised. The lungs were not collapsed; they crepitated on pressure, and were rather bloodless anteriorly; posteriorly they were somewhat gorged with blood, apparently from gravitation. The stomach had about a pint of fluid in it, which seemed to be water mixed with some undigested meat. The lining-membrane was slighly pink in colour. The right side of the heart was very flabby, and contained scarcely any blood. The blood throughout the body was quite fluid. The appearances of asphyxia were not so well marked in the lungs and heart of this subject as they usually are; nevertheless, the state of the windpipe, air-tubes, and stomach was characteristic of death from drowning.

As a contrast to this, and as showing the variable nature of the appearances met with in the drowned, the following cases are worthy of notice.

A woman, in full health, was observed to be intoxicated on the banks of a river, about one hour before her body was discovered in shallow water; she could not therefore have remained long under water. The body was examined about sixteen hours after death. The face was swollen, and of a mottled purple colour. The arms and thighs presented patches of discoloration, and a small quantity of whitish froth issued from the mouth, the amount of which was not increased by pressure upon the chest, although a small quantity of watery fluid escaped when the body was turned over. On opening the chest, numerous old pleuritic adhesions were found, on the removal of which, and by the consequent compression of the lungs, a discharge of watery froth took place from the mouth. All parts of the lungs were gorged with blood, and were much heavier and of a darker red colour than in the normal state. The posterior portions of both lungs were engorged. The windpipe and air-tubes contained the same kind of watery froth or frothy mucus as that which had issued from the mouth. The liver was large, engorged, and of a bright-red colour. The right cavities of the heart and the coronary veins were filled with dark fluid blood; the left cavities were empty (*Phil. Med. Exam.*, March, 1845, p. 169).

In a woman the cerebral vessels were nearly empty, the lungs rather voluminous, the bronchial tubes containing a small quantity of frothy mucus, and the right side of the heart containing a quarter of a pound of fluid blood. There was slight redness about the mucous membrane of the stomach and intestines—accounted for in the stomach by digestion going on at the time of death: the organ contained about a quart of fluid matter, consisting of food mixed with water, probably swallowed in the act of drowning. There were no traces of poison in the stomach, nor marks of violence on the body. In another case, the eyes were half open, the hands not clenched, the fingers straight, and the vessels of the brain very much congested. The lungs were distended, the windpipe was empty, and the air-tubes in their smaller ramifications were filled with a soapy tenacious mucus. The right side of the heart and larger veins were distended with fluid blood. The gullet contained a clear watery fluid—the stomach three ounces of a clear fluid destitute of smell and colour, with the exception of a green tint from a minute quantity of vegetable matter, resembling the confervæ of ponds. The liver was much congested. This woman was found drowned in a shallow pond. The body in each of these cases was examined shortly after death (*Lancet*, May 29, 1841).

Such being the general appearance of the body after death from drowning, the question will often arise in the case of bodies taken from the water, "if he did not die from drowning, of what did he die?" A negative reply may be the only possible one, or on the other hand most certain evidence of a natural or violent—other than drowning—cause of death may be found.

In consequence of the uncertainty attendant on the appearances of drowning, and the fact that there is no certain *sign* of drowning, it is sometimes assumed that the deceased must have died from some other cause. The general impression among non-medical persons appears to be that, whether in drowning or suffocation, there ought to be some particular *visible change* in some parts of the body to indicate at once the kind of death; but it need hardly be said that this notion is founded on false views. A medical inference of drowning is founded upon a certain series of facts, to each of which, individually, it may be easy to oppose plausible objections; but taken together they furnish evidence as strong as is commonly required for the proof of any other kind of death.

The two following cases are instances of death from a mixture of

epilepsy and suffocation, which are interesting and instructive in this connection:—

A man was in the act of leaving a privy, when he was seized with an epileptic fit, and fell with his face in a piece of dirty water, which did not exceed a foot and a half in breadth, with a depth of from three to four inches. When discovered after death, only his mouth and nostrils and one cheek were found to have been under water (Ogston, *Med. Gaz.*, vol. 47, p. 763. See p. 31).

A gentleman, æt. 30, who had retired to his dressing-room seemingly in good health, was for some time missing, and on breaking open the door his body was found lying in a sponge bath which he was in the habit of using. He was quite dead, but there was still some warmth about the body. He was lying on his face in the bath, with his nose and mouth below the level of the water. Some time before he was thus discovered a fall had been heard in his room, but no particular notice was taken of it. The body was inspected twenty-four hours afterwards. Externally there was a recent wound of the skin of the right arm above the wrist, evidently caused by pieces of a washhand basin which had been broken. There was much congestion of the brain and its membranes. The heart was slightly enlarged, and the walls of the left ventricle were thickened. In the right ventricle only a small clot of blood was found; with this exception the cavities were perfectly empty. There was some cartilaginous deposit in the aortic valves. The right lung was healthy, and presented no congestion; the left was wasted, but slightly congested. An inquest was held, when the medical and other evidence tended to show that, although the body was found with the face under water, the deceased had not died from drowning, but that he had been seized with a fit—probably epileptic; that he had fallen into the sponge bath, breaking the washhand basin in the fall, and thus producing the recent wound of the right arm. It turned out that he had previously had two epileptic fits. Kesteven has related a similar case, in which a man who was just about to jump into the water to rescue a boy who had fallen in by accident, was suddenly seized with paralysis and died in three hours. On examination there was effusion of blood on the brain, and this accounted for the apoplectic seizure (*Med. Gaz.*, vol. 44, p. 295).

HOW LONG HAS THIS BODY BEEN DEAD?

A medical man may be occasionally required to express an opinion on the length of time that may have elapsed since the act of drowning, when the dead body of a person has been discovered in water. The rules which have been suggested for the guidance of a medical witness on these occasions are given at pages 305 and 345 *et seq.* They are open to so many exceptions, owing to the different degrees in which putrefaction takes place in bodies exposed under similar circumstances, that they are but of little service as a basis for medical evidence. On the production of adipocere as a result of the decomposition of the body in water, and the properties of this substance, see page 308 *et seq.*

In connection with this question of "how long dead," a subsidiary one may arise, viz., **when does a dead body in water float?** At the trial of Spencer Cowper for the alleged murder of Sarah Stout, the buoyancy of the human body, living and dead, formed an important part of the inquiry.

The body of the deceased was found floating, about five or six inches below the surface of the water, in a pond which was only five feet in depth. From this circumstance it was assumed that deceased could not have gone living into the water, because—as it was alleged, and attempted to be proved by medical as well as nautical testimony for the prosecution—the body of every person who died from drowning sank, while a dead body thrown into water immediately after death from some other cause than drowning floated.

The medical witnesses for the prosecution contented themselves with stating that the bodies of persons who were drowned sank, without taking into consideration that there were circumstances in this particular case which might have accounted for the floating, and have entirely set aside the hypothesis of death before immersion. This was the body of a woman, and in women there is less bone and more fat than in males—conditions which tend to render their bodies lighter than water. The deceased was drowned in her clothes, and the clothes of women enclose much air, which tends to give to the dead body a buoyancy for a time. In addition to these facts, there were some stakes near the body, which might have aided in supporting it by the clothes. The presence of a small quantity of air in the lungs, or of gases in the intestines, at the time of death should, apart from all other considerations, have prevented the fact of the body floating from assuming that importance which was assigned to it by the court and some of the scientific witnesses. Other sailors were called for the defence, and they deposed that, after their battles and shipwrecks, they had always observed the bodies of the dead to sink, whether drowned or not, and that weights were attached to bodies buried at sea not for the purpose of sinking them, but of preventing them from floating as a result of putrefaction. This is the correct view of the question. Although it is not likely that the life of any one will ever again be endangered by a question of this kind, it is proper to state a few facts connected with the specific gravity of the human body.

The specific gravity of the human body in the *living* healthy state is made up of the combined specific gravities of its different parts; so that, as in all heterogeneous solids, it is a very complex quality. In the first place, about 72 per cent. of the weight of the body consists of water—hence the question of specific gravity can refer only to the remaining 28 per cent. of dry solids. The only part of the body which is lighter than water is fat. The specific gravity of this is 0·92, and it is calculated that the proportion of fat in an adult is about 5 per cent. of the weight of the body, or one-twentieth part. The specific gravity of muscle is 1·085, of brain 1·04, of the soft organs generally 1·05, of the lungs containing air 0·94, and of bone, the heaviest part of the body, 2·01. The lightness of the fatty portions is more than counterbalanced by the weight of the skeleton (about ten and a half pounds in the male, and nine pounds in the female), so that the naked human body, placed on water, has a slight tendency to sink. This tendency diminishes just in proportion to the quantity of the body immersed; because all those parts which are out of water, not being supported by water, become so much additional weight to the portion immersed. Hence the frequent cause of death by drowning. An inexperienced person exhausts himself by exertion, raises his arms continually out of the water, and as often sinks, owing to their weight having just so much effect on his body as if a weight had been suddenly applied to his feet to sink him. When the *whole* of the living body is immersed, the specific gravity, owing to the expansion of the chest, differs so little from that of water, that a very slight motion of the hands or feet will suffice to keep a person on the surface. The head, owing to the weight of the bones of the skull, has always a tendency to sink below the level of the water.

There are two circumstances which cause the specific gravity of the body to vary. If the quantity of *fat* is proportionably large, it will be diminished, and such a person will float more readily than another in an opposite condition. On the other hand, a large proportion of *bone* renders a person heavier than his bulk of water; and his body will sink more rapidly than that of another. These two modifying causes of buoyancy are liable to constant variation; hence the different accounts given by experimentalists relative to the specific gravity of the human body. The bodies of women are, *cæteris paribus*, of less specific gravity than those of men; the skeleton is smaller, and there is a greater proportion of fat—hence they more readily float. Infants and young children float with the greatest ease; the quantity of fat is usually in large proportion, and the bones are light, the earthy matter being not yet fully deposited. Thus, in infanticide by drowning, the body of the child rises very speedily to the surface, if, indeed, it does not remain altogether upon it.

There are some other points to be considered in relation to the buoyancy of the living human body. *Respiration.*—It is the fact of the lungs being filled with air that gives the general lightness to it. If these organs were emptied, and the chest contracted, then the specific gravity would be considerably increased: hence it follows that, *cæteris paribus*, a person with a large and capacious chest floats more easily than one whose chest is small and contracted. Hence, also, in a living person the body has a tendency to rise out of water during inspiration, and to sink during expiration, the quantity of water displaced under these two opposite conditions of the respiratory organs being very different. The entrance into water with the chest nearly emptied as the result of a loud scream or shriek, is very unfavourable to the buoyancy of the body.

The fact of the *clothes* being on the person may also make a difference, either from their nature, in serving to buoy up the body, or from their weight to sink it more deeply. Women are sometimes saved from drowning by reason of their clothes floating, and thus presenting a large surface to the water; it is partly owing to this circumstance that their bodies often remain floating on the water immediately after death. This happened in the case of Sarah Stout above. In a case of suicide, it was proved that the body of the deceased floated on the sea water for half an hour after the act of drowning; it was probably buoyed up by the clothes. But it is to be observed that the specific gravity of sea water is 1·026. This differs but little from the specific gravity of the muscles and soft organs; hence the human body floats much more readily in sea than in fresh water, and, indeed, except for the weight of the skeleton, it would have but a slight tendency to sink in the sea.

A drunken man, æt 40, who had gone to bathe in the sea, was accidentally drowned. His body did not sink. It was observed to be floating with the face downwards, and the mouth below the level of the water; when turned over, froth issued from the mouth. The man appeared to be alive, but insensible. An attempt was made to resuscitate him by the aid of the warm bath and other means, but these failed, probably owing to the water which had penetrated the substance of the lungs. The appearances met with in the body were peculiar. The lungs were fully distended, but there was no bloody mucus or water in the airtubes. In the windpipe and left air-tube, portions of the contents of the stomach were

found (pieces of cabbage, etc.); the heart was empty; the stomach contained a quantity of food half digested, but no water. The medical witness attributed death to apoplexy, followed by an attack of vomiting, a portion of the food having been drawn into the windpipe by an effort to breathe, the floating probably owing to the average specific gravity of the man's body not being greater than that of sea-water.

In 1892, the body of a girl was found floating face downwards in the sea in bathing dress, within an hour of the girl's death from drowning. The bodies of women have been found floating on the surface of ponds or rivers within a few hours of the period at which death by drowning must have occurred.

A woman who was seen on the banks of a river at half-past eleven in the evening, was found drowned at eight o'clock the following morning. The body was floating on the water with the face downwards. A factory girl fell into a river while walking along the bank in the evening, and the body was found floating on the surface of the water the following morning. In 1857, an accident occurred in which a woman was drowned, and the body floated immediately after death. The dead body of a woman was found floating on the surface of a pond, three or four feet deep, not far from her house. She had been missed from her bed a few hours, and had on only her night-dress. The body was floating with the head and belly downwards, the head and legs depending. There was no post-mortem examination.

Owing to the floating of the body, and the mental condition of the husband, it was supposed that he had first murdered his wife and had then thrown her dead body into the water. There was nothing but the floating of his wife's body to support this hypothesis, and the facts readily admitted of another explanation. The deceased was a small-boned woman with a fair amount of fatty deposit about her. There were no stakes or projections in the pond by which the body could be supported, and the buoyancy could not be referred to the clothes. The specific gravity of her body could have differed but little from that of water; and as she was found floating with her mouth downwards, the air in the lungs had been probably retained, and was sufficient to support the trunk. There had been no struggling; there was neither sand, mud, nor weeds in her hands. She had made no effort to save herself, and had probably deliberately destroyed herself by placing her head at once under water. The human body when it rises to the surface from putrefaction, usually floats belly upwards.

This is owing to the abundance of gas in the intestines and to the fact that the spinal column with its bones is heavier than the anterior wall of the abdomen, so that the trunk, unless anchored as it were by the hanging limbs, assumes a position of stable equilibrium, *i.e.*, a position in which the centre of gravity is as low as possible.

It may be laid down as a general rule, that the recently *dead* unclothed body is, when left to itself, *heavier* than water, and sinks when immersed. The expulsion of air from the lungs and their penetration by water, and the fact that the bones and all the soft parts, excepting the fat, are of greater specific gravity than water, offer a sufficient explanation of the sinking. After a variable period, generally not more than a few days, the body will rise again to the surface, and float. The period of its rising will depend: (1) on the specific gravity of the body; (2) on the nature of the water, whether salt or fresh; (3) on the action of heat and air in facilitating putrefaction. If the

gases generated find an escape, the body will sink; more gases may form, and then it will again rise, so that the sinking and rising may become alternate phenomena. A small quantity of air collected in the abdomen, as a result of putrefaction, will suffice for the floating of the body. Thus, taking the specific gravity of the dead body at 1·08 to 1·1, it would require but little air to keep it at or near the surface of the water. But a dead body, whether death has been caused by drowning or not, may not sink at all, owing to some one of the counteracting causes above mentioned.

WAS DROWNING THE RESULT OF ACCIDENT, SUICIDE OR HOMICIDE?

This question is more complicated on paper than in practice, for, as a rule, there is a body of collateral evidence which in itself renders medical evidence of secondary importance. The subject must all the same receive our earnest consideration apart from such influences.

Naturally, the actual fact of death directly from drowning has first to be established; this we have sufficiently discussed. A person may be suffocated, or may die from epilepsy, apoplexy, or from a sudden attack of any other fatal disease which may or may not be indicated by well-marked appearances after death; the body is thrown into or falls into water, and remains there a few days. When taken out, water may be found in the lungs, but there may be none in the stomach; there may be no mucous froth in the windpipe, and the lungs are found more or less congested. In the case of a suffocated body, without marks of external violence, it would be impossible to determine whether death had actually taken place within the water or not; since persons may die in water or at the moment of immersion, under circumstances in which the appearances of drowning would be either obscure or entirely wanting. Such cases have already been illustrated (*vide supra*).

Again, if in examining a body taken from the water we find the appearances of mortal disease sufficient to destroy life, there is a *primâ facie* ground for suspicion and inquiry. Why the body of a person who has really died from natural causes should be afterwards thrown into the water may or may not receive a satisfactory and innocent answer, but the question must be asked. In the following case convulsions were alleged as the cause of death, but the medical evidence proved conclusively that drowning was the real cause (*Reg.* v. *Longley*, C. C. C., April, 1841). The mother of the deceased child was charged with murder by drowning it. When the body of the child was removed from the water its mouth was closed. The prisoner's counsel endeavoured to make it appear that it was most usual to find the mouth *open* in cases of drowning; and that the only proof of suffocation by drowning which had been adduced was the mucous froth found in the air-cells; and that this could not have gone through the mouth, because the mouth was proved to have been closed. The air might have passed into the air-cells of the child whilst struggling in its mother's arms, just as well as whilst struggling in water. After what has been stated regarding the mucous froth, it is not necessary to point out the fallacy of the assumptions involved in

this argument. The state of the mouth did not affect the question of death from drowning. The mucous froth in the air-passages was the best possible evidence of this kind of death. The mouth might have been spasmodically closed after its production.

In this case no accidental falling in could be even suggested, but there is no reason why an adult should not be standing close to the water and fall in when taken with a fatal attack of disease. The following case also well illustrates the overwhelming strength of medical evidence in certain cases.

In *Reg.* v. *Griffin* (Shrewsbury Lent Ass., 1861) the prisoner was charged with the murder of her child by drowning it. The dead body was found on the bank of a river. The defence was that it was dead when she put it into the water. The medical evidence satisfactorily proved that there were no marks of violence externally—only a few abrasions of the skin as the result of accident. There was some sand in the mouth, nose, and ears. The brain was healthy, and its membranes were slightly congested. The lungs were congested and contained mucous froth, which was also found in the windpipe mixed with sand, particles of which were seen in the smaller air-tubes. The lungs were fully distended. The heart contained on the right side fluid blood; the cavities on the left side were empty. In the stomach were four ounces of fluid, with some partly digested food. All the organs were healthy. An attempt was made to refer death to convulsions, but the appearances, taken as a whole, were only consistent with death from drowning. The judge in this case asked the medical witness whether he was not influenced in coming to a decision by the fact that the body of the child had been found on the bank of a river. The witness said that he should have come to the same conclusion if he had not known of that circumstance; in which statement he was perfectly justified by the appearances, for there is no disease affecting children which will produce them. If the child had had convulsions, it was still exposed while living to the action of water. The prisoner was convicted.

Marks of Violence.—The greatest importance must be given to marks of violence, whether external or internal. The violence may have been so great as to account for death if inflicted on the living; on the other hand, they may be slight but of peculiar characteristics. The following case is particularly instructive in this respect, as the marks were very slight and required great acumen to interpret them correctly (*Reg.* v. *Carnt*, Suffolk Lent Ass., 1851, p. 19).

The body was removed after it had been lying about four hours in the water, and was carefully examined forty-one hours after death. The hair was hanging back, wet, very muddy, with leaves and weeds entangled in it; the ears were muddy, the right eye ecchymosed, the pupils slightly dilated, the lips bluish, and there were bluish patches on the face. *Slight scratches were observable on the right side of the face.* The skin had a dull leaden hue. The jaws were fixed, the teeth tightly clenched, and the tongue not protruding. The nails were filled with sand and mud. *There were severe bruises on both arms near the elbow, equal in extent and intensity.* The tongue was greatly congested, and covered with froth and mud, which extended backwards to the throat and nostrils as well as into the larynx and windpipe, and the upper divisions of the air-tubes of the lungs. The lungs were engorged and greatly distended: when cut in any part frothy mucus was abundantly poured out, and a watery liquid escaped on pressure. The heart was healthy; the right and left cavities were filled with black fluid blood, free from coagula. There were small pieces of green weed in the air-tubes, corresponding to weed in the pond. The vessels of the neck were distended with dark-coloured liquid blood, without any coagulum. The stomach was healthy, and it contained partially digested food, with about a pint of liquid mixed with mud and sand. The liver was enormously congested, bleeding profusely at every section. The bladder was quite empty, and contracted to the smallest size. The sinuses (large vessels) of the brain were not much distended, and the substance of the organ was not greatly congested.

Image gave an opinion, which was perfectly justified by these appearances, that the deceased had died from drowning, and that she had probably been held forcibly under water. The accuracy of this opinion, in spite of an attempt to overthrow it in the defence, was established by the confession of the convict before execution.

In the same connection of the correct interpretation of slight external marks, the following cases are also instructive:

An accident occurred some years since in which a man and his wife were thrown into the water by the overturning of a small boat. The woman was drowned. On an examination of her body a livid circle was found round her neck, as if she had been strangled, but no ligature to account for it. She had evidently died by drowning, and the mark on the neck had been produced by the string of a cloak which she wore at the time of the accident. In her struggles to reach the boat it is presumed that the tide had drifted the cloak in an opposite direction, and had thus produced the usual appearance of violent strangulation. It is not improbable that the constriction accelerated death. A man while being escorted along the banks of the river Po, as a prisoner, by a party of soldiers, attempted to escape, and was drowned. Besides the ordinary appearances of drowning, there was a deep livid circle, extending completely round his neck, and immediately below this another mark, paler in colour. The skin over the windpipe was ecchymosed. It was at first alleged that the deceased had been strangled by the soldiers, and his body thrown into the water; but from the appearance of the marks, and other circumstances, Barzellotti gave it as his opinion that they had been produced by the collar of a coarse linen shirt which had been tightly buttoned around the deceased's neck: the collar had contracted from the imbibition of water, and had thus caused the appearance of strangulation ("Quest. di Med. Leg.," vol. 1, p. 329. For another case, see Henke's *Zeitschrift*, 1840, vol. 1, p. 126, Erg. H.). In the winter of 1839, a man was carried away and drowned in attempting to ford a swollen stream. When the body was found it had been so placed by the current that the fore part of the neck was locked against the stump of a tree, giving rise to an ecchymosed patch like that which is sometimes produced by manual strangulation. (For the report of another case, in which there was much violence to the neck, see Henke's *Zeitschrift*, 1842, vol. 1, p. 258, Erg. H.)

It might be said, that in cases of this description circumstantial evidence would commonly show how the mark had originated. In admitting the truth of this observation, we must remember that circumstances, as matters of proof, do not always present themselves to our notice, or occur to our minds, at the precise time that the law stands most in need of them. While, then, we use great caution in drawing an inference when there are such strong grounds for suspicion, we should not neglect to examine carefully the most trivial appearances.

In a case of murder, in which the body of the deceased was discovered in a millstream, there was only one slight ecchymosed depression in the fore part of the neck, as if from a finger. The surgeon suspected from this that the deceased had been strangled by the pressure of a hand on the neck. The marks of drowning in the body were wanting, and the medical suspicion of the real cause of death was afterwards confirmed by the confession of the criminal. Such incised wounds may be found on the body as are quite irreconcilable with any theory of accident (*Reg.* v. *Upton*, Leicester Sum. Ass., 1864).

With regard to more severe violence, the chief inquiry is whether it has resulted from accident or design.

In forming an opinion, a witness must give due value to the accidents to which a body floating loosely in water may be exposed. Ecchymoses of considerable extent are sometimes seen on the drowned, when the bodies have been carried by a current against mechanical obstacles in a river or canal. It must be remembered that such bruises and

ecchymoses may not be visible when the body has just been removed from the water, especially if this removal takes place within a few minutes of death. If the deceased fell from a considerable height into water, his body in falling may have struck against a rock or projection, and thus have produced extensive marks of violence. Dead bodies taken out of wells often present considerable marks of violence when the deceased persons have fallen in accidentally, or have thrown themselves in intentionally. The presence of these marks must not create a hasty suspicion of murder. It is manifestly impossible to lay down any specific rules for forming a decision in cases of this kind. In clearing up doubtful points, everything must depend on the tact and acumen of the practitioner, who is called upon to conduct an investigation. The first question which he has to determine is, whether the injuries on the body were produced before or after death (see "Wounds"). If after death, then they ought to be obviously of accidental origin. Accidental violence may sometimes be of so serious a nature that a practitioner might well doubt whether it did not indicate that the deceased had been violently treated prior to submersion. An instance occurred in which both arms were accidentally dislocated at the shoulders in the act of drowning, in the case of a man who jumped from the parapet of Old London Bridge into the Thames. This exploit, it appears, he had previously performed with impunity, but on the last occasion he sank and was drowned. Both his arms were found dislocated at the shoulder-joints, in consequence, it is presumed, of his having fallen with them in the horizontal position, instead of placing them closely to his sides. The concussion of the arms on falling into the water had sufficed to produce the accident ("Smith's For. Med.," p. 228). Here, then, we have a proof that even the mechanical resistance offered by water alone may give rise to marks of violent injury on the person. Effusion of blood from this cause may take place into the cavities of the head, chest, or abdomen. Chevers examined the body of a sailor who fell into water with his head downwards; and it was found on inspection that there was an extravasation of blood in the head beneath the arachnoid membrane, and there was every reason to believe that extravasation had been produced by the fall.

Fractures of bones may, of course, possibly be accidental, as in diving into shallow water with a hard supporting basis. Except under such circumstances, fractures are not often met with in the drowned as the result of accident.

This point was raised in *Reg.* v. *Kettleband* (Nottingham Wint. Ass., 1843), where the prisoner was charged with the murder of a boy aged ten years. The deceased was found dead in a pond, soon after he had been seen healthy and well. An inquest was held, no inspection of the body was required by the coroner, and the jury were directed to return a verdict of "found drowned." An inspection was, however, subsequently made. The neck was observed to be very loose, and on further examination the toothlike process of the second vertebra of the neck was found to be separated from the first (the atlas), and the ligaments were ruptured. The three medical witnesses who gave evidence at the trial deposed that this displacement had caused death by compressing the spinal marrow; that the injury had occurred during life; and that it was not likely to have been caused by accident

from a fall into the water, as there was no mark of a bruise about the head, and the pond was small, with a soft muddy bottom. All agreed that such an injury was not likely to have arisen from a blow or a fall under any circumstances, but it required for its production that the body should be fixed, and the head forcibly rotated on the trunk. It was in itself sufficient to account for immediate death, and it could not occur by accident after death from any other cause. Hence it was inferred—1st, that death could not have been caused by drowning; 2nd, that it had resulted from the compression of the spinal marrow by displacement of the second vertebra; and 3rd, that this injury must have been intentionally produced by some person prior to submersion. Circumstances fixed the crime on the prisoner, and the jury returned a verdict of manslaughter.

It is an important question, whether fractures of the *vertebræ of the neck* can occur from accident alone, at or about the time of drowning. For a case in point, proving its possibility, *vide Lancet*, 2, 1904, 1076, where is related the case of a boy who fractured his neck by collision with a fellow bather. In the above case, the medical witnesses had probably good reasons for denying that the injury was accidental, although such an opinion cannot always be safely expressed merely from the absence of marks of violence on the head. In 1858, a gentleman, in jumping from a bathing-machine head foremost into water more shallow than he had expected, caused a fracture and displacement of the vertebræ of the neck, which led to death. A man threw himself into a river to bathe from a height of seven or eight feet, the water being only three feet deep. He rose to the surface, but fell back senseless. When he recovered his consciousness, the account he gave of the accident was, that he felt his hands touch the bottom of the river, but to save his head drew it violently back, upon which he lost consciousness. He died in about ten hours, and on examination the skin of the back of the neck was ecchymosed, the interspaces of the muscles were gorged, and the spinal canal was filled with blood. The body of the fifth vertebra of the neck was broken across about the middle of its depth, and the two pieces were completely separated from the lateral parts. As there was no mark of contusion or dirt on the head, Reveillon believed that the fracture arose from muscular action, and not from a blow received by striking the bottom; but this is doubtful. In another instance a sailor jumped headlong into the sea to bathe, a sail being spread three feet below the surface. He immediately became motionless, and died in forty-eight hours. The fourth and fifth vertebræ of the neck were found extensively fractured, and the spinal marrow was crushed and lacerated ("Chelius's Surgery," "Fractures"). In this case the fracture must have resulted from contact with the water or the sail; but as the latter was freely floating, this would be a yielding medium: hence this injury may occur accidentally in cases in which we might not be prepared to look for it. (For an important case, see "Ann. d'Hyg.," 1839, 2, 195.)

Violence of the nature of cutting may give rise to grave suspicion. The principal points to be determined in such cases are obvious. 1. Were the cuts made before or after death? This point will be found fully discussed under "Wounds" pp. 436 *et seq.* 2. Could they have been

self-inflicted? This point has also been fully discussed (*ibid*), but it must be here noted that several cases are now on record where suicides have cut their throats deeply just before throwing themselves into deep water. As in all other cases of this nature, it is obvious that the longer the body has been in the water before inspection, the less easy will it be for the medical man to give evidence of a definite and positive character.

The violence inflicted by fishes, rats, molluscs, etc., on a body in the water is generally fairly easy to distinguish. The edges of the raw surface are more eroded rather than ragged or sloughy; there may be the actual marks of the teeth, or possibly even shell-fish *in situ;* but no doubt cases may arise of great difficulty in this respect, especially if the animals attack the place where an open wound gave them easy access to the flesh; though this will in general tend more to obliterate homicidal or suicidal wounds than to exclude the action of animals.

Suicides by no means infrequently try more than one method of shuffling out of the world, hence it is by no means unknown to find poison in the stomach of those drowned. Dr. Stevenson met with a case in which there was every reason to think that a man had taken a fatal dose of aconitine, and then had swum out to sea; on the other hand, Dr. Tidy quotes a case where one woman administered arsenic to a friend, and, finding its action too slow for her liking, pushed the victim into the water; hence the finding of poison in the stomach of a drowned person cannot be accepted as proof of intent in any direction, but it requires explanation, which must be sought in the circumstantial evidence surrounding the case.

Pistol or gunshot wounds, again, may be homicidal or incurred suicidally on the banks of a stream or sheet of water. They will require the same consideration as if found on a body not in the water (*vide* pp. 565 *et seq.*).

Drowning in shallow water similarly requires explanation, as it naturally occurs to a juryman to ask why did the person not remove his head from such an easily avoidable position. It is, of course, ridiculous to suppose that shallow water is insufficient to drown a person. The mere immersion of the mouth and nose in water or mud, not more than an inch or two in depth, is quite sufficient to produce all the phenomena of asphyxia (*vide* "Suffocation"); and, not to mention epileptics and drunkards, where the occurrence is probably accidental, there are many well-authenticated cases in which suicide has thus been perpetrated. It is easy to conceive of circumstances in which assailants or an assailant may hold a victim's head in such a position until life is destroyed; in the latter case we might expect to find marks of violence on the body or signs of a severe struggle if the person were conscious and capable of making resistance. In any case of this nature it is the duty of a medical man to note every possible circumstance, even to the extent of visiting the site where the body was found, if possible; he must then weigh his evidence of asphyxia and balance it up with all the surrounding circumstantial evidence. The following cases well illustrate the position:—

Devergie mentions an instance where a man was found drowned in a small stream, his face towards the ground, and his head just covered by the water, which was not more than a *foot* in depth. On dissection there were all the appearances of

drowning present, and a large quantity of sand and gravel was found occupying the windpipe and smaller air-tubes (*Op. cit.*, vol. 2, p. 332). A woman committed suicide by breaking a hole in the ice of a pond, and thrusting her head into the water, the rest of her body being out. In 1837 a man was found dead near Mitcham. He was discovered lying on his face in a small stream of water only six inches deep. The water was so shallow that it did not cover the deceased's body or his head. There was clear evidence that this was a case of suicidal drowning. In 1855 a man was found drowned in a water-cistern, which at the time had in it only fourteen inches of water.

Again, on December 30th, 1903, an inquest was held at Duston, Northamptonshire, on the body of John Starmer, a gardener, who was drowned in a brook. There were less than six inches of water in the stream. The man's face was on the mud at the bottom, and his hair was frozen. It was stated that his father committed suicide by hanging. The jury returned a verdict of accidental death.

A man was found dead with his face in some melted snow, and there were several severe contusions on his body. The evidence showed that, after a quarrel, he had left a neighbouring inn much intoxicated; and it was rendered extremely probable that he had perished accidentally on his way home. There was no reason to suppose that he had been murdered.

A case was tried at the Norwich Lent Assizes in 1841 (*Reg.* v. *Yaxley*), and the prisoner was convicted. It appears that the mode in which the prisoner destroyed her infant child was by immersing its head for a few minutes in a pail of water. She removed it before it was quite dead; but it soon died, with slight convulsive motions of the limbs. The case was rendered obscure by the fact that the whole of the body had evidently not been immersed; and the only conceivable means of drowning were in a small duck-pond adjoining the house, which was covered with weeds; but no weed was found in the stomach of the child, although a quantity of water was there present. In 1854, a case occurred in London, in which a woman was charged with causing the death of a child by drowning it. The child was found dead, with its face in a basin of dirty water. The prisoner had placed the child in this position, and had then locked the door. The death of a child under these singular circumstances is, however, quite compatible with *accident*. In 1848 Tubbs was called to see a child, æt. 18 months, which was stated to be dying. On his arrival he found it dead: The skin was cold, and the countenance calm and pale, with the exception of a livid discoloration in the centre of each cheek. The eyelids, as well as the mouth, were half open. The pupils were widely dilated. A frothy mucus, tinged with blood, was escaping from the mouth and nostrils. The tongue was swollen and protruded. The mother of the infant, a respectable woman, gave the following account:—She was washing in one room while the child was in an adjoining room, the door between the rooms being kept open by a pail half full of water. She went out of the house for about two minutes, and on her return she found the child with its head downwards in the pail of water, the heels and part of the body hanging over the side of the pail. She snatched it out and tried to revive it, but without effect. There was no reason to doubt the truth of her statement, and at the inquest the jury returned a verdict of accidental death. The helplessness of an infant of this age, and the rapidity with which the insensibility of asphyxia supervenes, sufficiently account for death under these circumstances. It is, however, difficult to understand how an adult could be thus accidentally drowned. In 1864, a Mr. Gibbs was found dead in a water-cistern of his house. He was partly dressed; his head was downwards in the water, and his feet resting on the edge of the cistern. It was supposed that in reaching forward to the tap, he had lost his balance and fell with his head foremost into the water, and was thus unable to extricate himself. The facts seem to point to accident. A case occurred in London in 1841, in which a drunken man was drowned by falling on the bank of the Surrey Canal, with his head partly in the water, while the greater part of his body lay on the bank out of the water. It was by partial immersion that the Italian boy, Carlo Ferrari, was destroyed many years since by Bishop and Williams, who afterwards attempted to sell the body for the purposes of dissection. The murderers first intoxicated the deceased, and then suspended him by his heels in a well, so that his mouth was but a few inches below the level of the water.

A medical man, therefore, must not allow himself to be deceived respecting the cause of death on finding that the *whole* of the body has not

been immersed, or that the clothes are not wet. In this form of murder, when the inspection is recent, the hair of the head will present the appearance of wetness, and some water, with or without weeds or other foreign matters, may be found in the ears, nostrils, throat, and lungs.

Ligatures on the Body.—We may now consider the inferences to be drawn from the presence of any ligatures present on a body taken from the water. In a case of this kind it would be obviously of great importance to determine in the first place whether the deceased had really died from drowning or not; since, if his death had not been caused by drowning, the fact of his body, so bound, being discovered in water, would furnish the strongest possible evidence of murder ("Ann. d'Hyg.," 1833, 1, 207), and it is usually considered that ligatures offer strong *primâ facie* evidence of homicide; but numerous cases are recorded in which suicides have bound themselves in this manner before throwing themselves into water, probably for the purpose of preventing any chance of their escaping death. In 1832 the body of a man was removed from the Seine, his neck, legs, and hands being secured together by a cord furnished with a slip-knot. There was no doubt that he had died from drowning, and that the act was one of suicide, the cord being so placed on his body that a person could have easily placed it on himself. In this case there was no great degree of ecchymoses produced by the cord, and it was not probable that there should have been when it was arranged by a suicide, since his object would be merely that of rendering himself helpless by securing his arms and legs. This he would doubtless accomplish without giving himself much pain. A case somewhat similar was the subject of an inquest at Richmond in 1870. The hands and legs of the deceased were found tied. Round the wrists there was a slip-knot by which the cord could be drawn tightly. The legs were also tied in front. The circumstantial evidence proved that this was an act of suicide. If the marks bear the evidence of violent constriction, especially on *both wrists*, or on the fore part of the neck, the presumption of murder becomes strong.

The nature of the evidence to be given will evidently depend upon the position, the tightness, the nature of the ligatures, as well as the position of the knots in them; their nature, too, *i.e.*, the material and stains on them, in fact, we must carefully consider every point about them (*vide* "Strangulation," where the principal points are more fully set out). If the limbs only are tied, we must try to ascertain if they are tied in a way in which we could possibly tie them ourselves. Too much must, however, not be expected from evidence of this kind, as a clever murderer or a cunning suicide might simulate nearly every point to suit his purpose. There is just this to be said, that accident is, by the presence of a ligature, almost certainly excluded (unless circumstantial evidence of overwhelming nature be at hand to establish it), as in the following case of two men being found drowned together on April 3rd, 1904:—

At Stetchworth, Cambridgeshire, an inquest was held by Mr. Lyon, coroner, on the bodies of two men named Wallis and Norton, one a letter carrier, and the other an engine driver, who were found drowned in a tank at Stetchworth Water Works under mysterious circumstances.

The deceased were last seen going towards the water works after leaving a public-house at ten on Wednesday night. They were evidently sober. The witness who saw them on this occasion said he might have told the police they asked him

to accompany them to the tank, but he did not remember it. A policeman on dragging the tank about noon on Thursday discovered the bodies of the two men bound together by string, which was passed round an arm of each man. There was also a rope round the bodies of both. The door of the engine-house, through which the deceased had to go to reach the tank, was locked, and the key found in Wallis's pocket. There were no signs in the building of a struggle, and everything went to show that the case was one of deliberate suicide. One witness described Wallis as "funny" at times through the effects of drink.

The jury, in accordance with the coroner's direction, found each of the deceased guilty of murder of the other, since the action was concerted, and being of opinion that both were of weak intellect; they also found that the men committed suicide while temporarily insane.

Weights attached to Body.—If a body is taken out of water with heavy weights attached to it, the question of *accident*, as in the former case, is removed. It must be either homicide or suicide, and doubtless many would be apt to suspect that it was a case of murder. Several instances have, however, occurred in which persons have committed suicide by drowning, and heavy weights have been found attached on their feet and hands, or in or about the dress. Much the same remarks here apply as in the case of ligatures above; the nature of the weights, how they are attached to the body, *i.e.*, by ligature or fixed in the clothes, etc., each and all of such findings throw much light on the case if properly handled: but again circumstantial evidence will be very much to the fore.

Age of the victim has some bearing on the question of accident *v.* suicide or homicide and also on suicide *v.* homicide. The youngest suicide from drowning I can find is a boy of seven, quoted in former editions of this work.

It will be seen from the foregoing discussion, therefore, that while the answer to the question of whether the act of drowning was the result of accident, suicide, or murder belongs properly to the jury, there are many important points that require to be noted by a medical witness that he may guide the jury aright. We may briefly summarise some of the questions to which he can be fairly expected to give more or less positive answers:—

1. Did this person die specifically from drowning?
2. If not, what did he die of?
3. If wounded, were the wounds (*a*) such as by themselves to cause death; (*b*) inflicted before or after death; (*c*) self-inflicted or by someone else?
4. If tied up, could the tying have been done by the victim, or must it have been done by others?
5. Similarly, if weighted, could the weights have been self-attached?

TREATMENT OF THE APPARENTLY DROWNED.

Though in general it may be said that this is hardly a medico-legal subject, nevertheless, in view of the fact that at coroners' inquests, the propriety of the treatment adopted by a medical practitioner, and also the assiduity of his persistence therein, are, or may be, occasionally called in question, it must receive a little notice in the present treatise.

On some points there is still difference of opinion, and while warmth and friction alone have proved successful after an immersion of fourteen minutes (*Med. Gaz.*, vol. 31, p. 449), it is now generally admitted that some form of artificial respiration is advisable.

We think that the position of the question in 1903 may be fairly stated, as follows :—

A.—That in those apparently drowned, or in those actually dead, the factors that are mainly responsible for the condition are :—

(1) Absence of air from, and presence of water in, the lungs (for the difference of opinion as to which of these two is the more important, *vide* the Report of the Humane Society of the Commonwealth of Massachusetts for 1895—6).
(2) Abstraction of warmth from the body.
(3) Exhaustion.
(4) (Very subsidiary), presence of water in the stomach.

And hence—

B.—That the immediate steps to be taken for resuscitation in order are :—

(1) Wipe the mouth and nostrils as dry as possible, and remove as much mud, or other foreign material possibly blocking the air-passages, as can rapidly and easily be done.
(2) Strip the body to the waist, if not already naked, and dry it by vigorous rubbing with dry articles.
(3) Proceed with artificial respiration.
(4) Apply warmth to the body as soon as practicable.
(5) Avoid all violent movements, and "make haste slowly," remembering that the natural respiratory movements are only performed some seventeen or eighteen times a minute.

So far all are agreed, but it is in the precise details of how No. 3 should be carried out that differences of opinion chiefly show themselves ; the differences depending mainly on the different views mentioned above, under A. (1).*

The editor is strongly of opinion that the exit of water is of the two the more important for the following reasons : (1) ordinary cases of illness, of characters and varieties too numerous to mention, show, that life can be maintained with very much less (say, with a fraction like one-tenth), gaseous interchange than is customary in health; (2) experimental results already mentioned on p. 652, showing the difference between blocking the air way simply, and the aspiration of water ; (3) the deaths that occur after apparent recovery from drowning, *vide infra*, p. 689, in the human subject from the aspirated water alone, so far as we can see. Granting all this, however, it must still be insisted upon that the entrance of air must not be prevented by blocking of the upper end of the trachea; and Dr. Bowles (for a very full and lucid discussion of the whole problem *vide* Bowles' "Practical Points in the Treatment of Threatened Asphyxia," *Lancet*, vol. 1, for 1901, pp. 1,743 and 1,814) has given very convincing reasons for believing that this block actually occurs from the falling back of the epiglottis against the posterior wall of the pharynx. *Vide* also *Lancet*, 2, 1903, p. 1,653, for a long discussion at the Med.-Chir. Soc.

We are thus met with indications which are somewhat conflicting :

* For the latest discussion, *vide* Schäfer, *B. M. J.*, 2, 1904, p. 1179.

on the one hand artificial respiration pure and simple can be most readily carried on with the patient lying on his back, on the other hand the dangers of the epiglottis falling back, and so blocking the trachea, are very much increased by this supine position, and so too are the difficulties of emptying the water from the lungs or rather from the mouth, for it can only flow from the mouth in this position by overflow from a mouth full of it, and this must effectually block the air entrance.

It would seem, then, that these indications can best be met by placing the patient in a "prono-lateral" (Dr. Bowles) position, pulling forward, and fixing forward if possible, the tongue, and promoting respiration by alternately turning the patient fully on to his face, exerting a good pressure on the back in this position with a pad, just in the epigastric region, so that the mouth is thus a little lower than the lungs and stomach, and then restoring him to the prono-lateral position with, if necessary, the pulling of the arm which is uppermost as far above the head as possible, to increase inspiratory movements. These alternating movements from absolutely prone to prono-lateral are stated (by Dr. Bowles) to be very efficacious in (1) avoiding the dangers of blocking the air-passages; (2) in emptying the upper lung; (3) in promoting natural efforts at respiration.

During this time stimulants such as ammonia, aromatic vinegar, etc., may be cautiously applied if at hand to the nostrils, in the hope of producing reflex efforts at extraordinary respiratory efforts. So soon as any spontaneous respiratory action is observed, warmth may be applied to the skin by the warm bath or otherwise, and stimulating frictions may be used, or simple frictions with warm flannels, etc. Heat should be applied especially to the region of the heart, the loins, soles of the feet, and palms of the hands. When the power of swallowing returns, warm water, alone or with a little brandy as a stimulant, may be given. The patient should then be placed in bed and allowed to sleep.

Such are in the editor's opinion undoubtedly the best means of resuscitating the apparently drowned, but, inasmuch as artificial respiration may be required, as in hanging, strangulation, etc., under conditions in which the lungs are not filled with water, the Silvester method of performing it is here introduced, its objection in cases of drowning is, as shown above, that the patient must be placed flat on his back.

An inspiratory effort is induced by extending the arms upwards by the sides of the head: on restoring them to their original position by the sides of the body, the expanded walls are allowed to resume their previous state, and expiration takes place, the quantity of air expelled being in proportion to that which had been previously inspired.

The arms should be gently carried outwards and upwards from the chest, raised above the head, and maintained in this position for about two seconds. By this movement air penetrates into the lungs, as during the act of inspiration. The arms are now lowered and brought closely to the sides of the chest, by which expiration is effected. Pressure on the lower part of the chest-bone (sternum) aids this expiratory action. This movement should also occupy two seconds. These alternate movements of the arms may be repeated from twelve to fourteen times in a minute. All rough handling should be avoided.

The two wood-cuts taken by permission of the Royal Humane Society, from its pamphlet on the subject, well illustrate the position.

Dr. Laborde (*Bull. de l'Acad. de Med.*) goes so far as to maintain that artificial respiration itself is best promoted by the following simple plan, which consists in opening the jaws as widely as possible with a stick or knife-handle, then firmly grasping the tongue with or

Figs. 27 and 28.



I.—Inspiration.



II.—Expiration.

To illustrate the position of the body during the employment of Dr. H. R. Silvester's Method of Inducing Respiration.

without a cloth between the thumb and index finger, and pulling it strongly and rhythmically fifteen or twenty times a minute, letting it go back again each time. These pulls, the report says, should act on the root of the tongue, and draw the tongue well out of the mouth. They should be continued for at least a quarter of an hour, and, when the breathing is accentuated and sure, artificial respiration, warming, flagellation, and such like better known remedies should be applied.

DEATHS FROM SECONDARY CAUSES.

Drowning may operate indirectly as the cause of death. Thus it has been repeatedly remarked that persons who have been rescued from water in a living state, and who have apparently recovered from the effects of submersion, have died after the lapse of some minutes or hours: others have lingered for one or two days, and then have sunk apparently from exhaustion. In those who perish soon after removal from water, death may arise either from exhaustion or from the obstruction of respiration by the penetration of water into the air-cells of the lungs. In one case death was clearly owing to the secondary effects of submersion. The deceased was removed from the water and conveyed to the hospital. He was cold and insensible, but he breathed tolerably well, and had a fair pulse. In about three hours he became conscious, and spoke a little. The insensibility subsequently returned, accompanied by great difficulty of breathing, and he died in about twenty hours from the time of submersion. It is the experience gained from such cases, which are by no means uncommon. that gives such strong support to the view mentioned above, p. 686, that the entrance (or exit) of water is of more importance than the absence of air. Marcet states that spasm of the glottis has been among the secondary symptoms in those who have been removed from the water apparently drowned. A severe spasm of this kind manifested itself in one case while placing the person in a warm bath. (*Med. Times and Gaz.*, February, 1857, p. 148.) When death takes place at a remote period, it may be caused by disease; and a question will then arise, whether the disease was produced by the immersion in water or not. Such cases occasionally present themselves before the Courts. In one of these (*Reg.* v. *Pulham*, Gloucester Sum. Ass., 1845), the prisoner was charged with the death of the deceased by pushing him into a pond of water, from the effects of which he died. The deceased was an old man; he was taken out of the water in an exhausted condition, and died a few weeks afterwards. One medical witness referred death to the effects of the immersion; but as he had not seen the deceased after the violence, and there was no clear account of the cause of death, the prisoner was acquitted. In most of these cases it will be found exceedingly difficult to connect death with the immersion, when the fatal result does not take place until after so long a period of time. As the basis of medical evidence, we must rely upon the nature of the disease alleged to have been caused by the immersion—*i.e.*, inflammation of some cavity or organ, and its progress until death, without intermediate recovery or interference by improper treatment.

Should such a case occur it is easy to conceive of its giving rise to very interesting problems. In addition to the simple effects of drowning sufficiently discussed, there might have to be considered (1) the nature of the fluid, setting up a septic pneumonia; (2) exposure to cold, rendering a person more liable to any disease: this has been demonstrated in the case of the lower animals, *e.g.*, hens in whom the lowering of the body temperature renders them susceptible to doses of hen cholera, which they were able to resist in a normal state; (3) violent efforts causing rupture of an aneurysm or fatal cardiac distress: no general principles can be laid down, each case must be decided on its own merits.

SUB-SECTION B.—HANGING.

DEFINITION OF HANGING.
SYMPTOMS OF HANGING.
CAUSE OF DEATH IN HANGING.
TREATMENT OF PERSONS APPARENTLY HANGED.
POST-MORTEM APPEARANCES IN THE HANGED.
WAS DEATH DUE TO HANGING?
WAS IT ACCIDENT, SUICIDE, OR HOMICIDE?

DEFINITION OF HANGING.

By hanging we understand that form of death in which the body is wholly or partially suspended by the neck so that the constricting force applied to the neck—and by means of which death is in some way produced—is the weight of all or part of the body acting upon the ligature used as its point of support. It differs from strangulation in forensic meaning in that in the latter some external force other than the weight of the body is the means by which the neck is constricted.

SYMPTOMS OF HANGING.

These are not of very much medico-legal interest except in so far as they throw light on the cause of death in this form of violence, and also explain how easy it is for accidental and suicidal hanging to occur under circumstances from which it might otherwise be thought escape would be easy.

We learn from those who have been resuscitated, as well as from experiments performed by persons upon themselves, that the insensibility of asphyxia comes on in the most insidious manner in death from hanging, and that a slight constriction of the windpipe will speedily produce loss of consciousness and muscular power ("Devergie," 2, 370). The only symptoms of which the hanged persons have been conscious were a ringing in the ears, a flash of light before the eyes, then darkness and oblivion. The only useful inference, in a medico-legal view, which can be drawn from observations of this kind is, that asphyxia is not only rapidly induced, but that it supervenes under circumstances where it would not be generally expected to occur—*i.e.*, when the body is in great part supported. Fleischmann found that a cord might be placed round his neck between the chin and hyoid bone, and tightened either laterally or posteriorly, without perceptibly interrupting respiration; but while the respiratory process was thus carried on, his face became red, his eyes prominent, and his head felt hot. These symptoms were followed by a sense of weight, a feeling of incipient stupefaction, and a hissing noise in the ears. On the

occurrence of this last symptom, the experiment, he says, should be discontinued, or the consequences may be serious. His first experiment on himself lasted two minutes; but in the second, owing to the cord by its pressure more completely interrupting respiration, the noise in the ears appeared in *half a minute*. When the pressure was applied on the windpipe the effect was *instantaneous*, but when on the cricoid cartilage it was not immediate. If it was applied between the hyoid bone and the thyroid cartilage, or on the hyoid bone itself, the period during which a person could breathe was extremely short; and this result was more striking when the act of expiration was performed at the moment of applying the pressure. Hammond had himself partly strangled in a chair. A towel was passed round his neck and the ends twisted together by a medical friend; while another friend stood in front to watch the face and make necessary tests. As the twisting proceeded, Hammond first noticed a sensation of warmth and tingling, which began with the feet and spread over the body; vision partly disappeared, but there was no appearance of coloured lights. The head felt likely to burst, and there was a roaring in the ears; consciousness continued, and he could tell his friend whether he suffered pain from the knife-thrusts being made into his hand. In one minute and twenty seconds from the commencement, all sensibility was abolished. In another experiment sensibility ceased in fifty-five seconds. A knife-thrust, sufficient to draw blood, caused no sensation whatever.

The very insidious and painless manner in which a person who is suspended passes from life to death, is also well illustrated in the report of the case of Hornshaw (*Lancet*, April 17th, 1847, p. 404). This man was on three occasions resuscitated from hanging—a feat which, like Scott, he had performed for public gratification. He stated that he lost his senses almost at once; that it seemed as if he could not get his breath, and that some great weight was attached to his feet; he felt that he could not move his hands or legs to save himself, and that the power of thinking was gone. It is not improbable that persons have thus lost their lives by privately attempting these experiments, and their cases have been set down to acts of suicide. There is reason to believe that boys have thus unintentionally destroyed themselves, from a strange principle of imitation or curiosity. The following is one among many instances of this kind.

In 1844, a boy, aged fourteen, witnessed an execution at Nottingham, and he was afterwards heard to say that he should like to know how hanging felt. On the same afternoon he was found suspended by a cord from a tree, quite dead; and from the circumstances there could be no doubt that he had been experimenting on the theory and practice of hanging, and that he did not intend to destroy himself. The jury returned a verdict of "accidental hanging."

It is seen from these facts that the time anybody who may be in danger of death from hanging, either accidentally or suicidally, has for escape, is very short indeed, and may be practically nothing at all if the ligature should happen to press directly on the trachea.

CAUSES OF DEATH IN HANGING.

From the great differences with regard to the distribution of the blood in the internal organs of those who have died from hanging it

has been inferred that the actual cause of death must have been different in different cases. There are undoubtedly from a theoretical point of view at least four or five ways in which death might take place, but recent experiments have to some extent reconciled the various post-mortem appearances with a common cause of death, viz., asphyxia, which they have shown may be associated with different instead of uniform results. We must, however, consider the various possible views. Death may then take place from—

1. Simple blocking of the air-passages (asphyxia pure and simple).
2. Congestion of venous blood in the brain (pressure on jugular veins).
3. Lack of arterial blood to the brain (rupture of carotids).
4. Syncope from pressure on the pneumogastric nerves.
5. Injury to the spinal column and the cord.
6. Combinations of any of the above.
7. Death after apparent recovery.

1. **Simple Blockage of the Air-passages.**—Both experiments, and observation on persons hanged, have shown that this is very easily brought about, its occurrence depending on the position of the ligature above or below the larynx and upon the degree of force used. Dixon Mann ("For. Med.," p. 185) quotes Maschka as having found the ligature above the larynx in no less than 149 cases out of 153 (on it in one and below it in three), but a knowledge of the shape of the front of the neck and a little consideration of the position of the head and body would clearly indicate this as the probable position. Langrenter and Ecker are quoted by Dixon Mann as proving this point by actual dissections. When the air-passages are thus blocked asphyxia must naturally be the prominent cause of death with corresponding post-mortem appearance (*vide supra*, p. 649).

2. **Venous Congestion of Brain.**—When a ligature is applied round the neck the principal venous trunks undoubtedly become somewhat compressed, and as they form the main channels for the return of blood from the brain, etc., it is at once obvious that there is likely to be produced in hanging a great stasis in the venous circulation in the brain. From simple clinical experience (as in violent fits of coughing) we know that such a condition may easily cause unconsciousness; it may then take a share in the production of death in hanging; on the other hand experiments in hanging a dog with an artificial opening (kept patent) in the trachea show that it is not the predominating factor in most cases, for the animal lived suspended for some three hours. Actual extravasation of blood from the cerebral vessels from this cause is very rare; the result (unconsciousness) seems to be in practically all cases produced by the mere interruption to the removal of venous blood.

If the venous apparatus of the brain is found very full of blood death is said to be by "apoplexy," if the lungs are very much engorged death is said to be by "asphyxia," as a matter of actual numbers a combination of the two is by far the commonest result, occurring in 130 cases out of 169 collected by continental observers; it has been shown that the precise point in a respiratory cycle at which hanging took place affected the results as follows: if the animal was hung at the end of full inspiration the lungs contained little blood

and the brain sinuses much, and the opposite was the condition if hung at the end of expiration. This explanation may be very satisfactory from an academic point of view as reconciling the various post-mortem appearances, but is of very slight medico-legal importance applied to human beings, in whom we have no possible opportunity of observing the precise respiratory moment when they begin to hang.

3. **Lack of Arterial Blood sent to the Brain.**—Professor Hoffman considers that the carotids might be compressed against the transverse processes of the cervical vertebræ. Considering how well the carotids are protected in the neck the editor is of opinion that such a compression must very rarely, if ever, take place in accidental or suicidal hanging, and he is not aware that any observations have been made tending to substantiate the theory. In violent hanging (judicial or homicidal), on the other hand, there are observations (*vide* "Post-mortem Appearances," *infra*, p. 702) showing that the carotids do occasionally get blocked by actual rupture of their inner coats.

4. **Syncope from Pressure on the Pneumogastrics.**—We are again indebted to Professor Hoffman for this suggested cause of death in hanging; but considering their position behind and between the carotid artery and jugular vein, it is surely impossible that the nerves could possibly be affected by pressure, or indeed any form of violence, without the artery and vein being previously affected and causing all the phenomena which could be attributed to the injury to the vagi. We have, too, most direct positive evidence against the vagi sharing in death. If they were factors they could only be so by causing rapid stoppage of the heart, but we have seen ("Asphyxia," p. 648) that in death by hanging the heart frequently continues to beat several (as many as fifteen in one case) minutes after all other signs of life have ceased.

5. **Injury to the Spinal Column and Cord.**—This can only take place when the hanging may be described as violent; suicides will occasionally give themselves a drop, but it may be said generally to occur only in judicial hanging. Devergie found the ligaments between the first and second vertebræ of the neck ruptured only once in fifty-two suicidal cases.

Judicial Hanging.—In executions instant death is certainly desirable on the sole ground of public opinion, and it seems probable to the editor that such is now always attained by means of a drop graduated in length somewhat inversely to the weight of the criminal. The same purpose was attained in olden days by giving a rotatory movement to the body at the moment the bolt was drawn, whereby the odontoid process of the axis was displaced and caused instant death by pressure upon or laceration of the spinal cord.

It is often reported that after a judicial hanging the body gives violent convulsive movements. It is worth while to allay the sentimental objections to hanging which arise from newspaper reports of such occurrences. These movements can by no stretch of the imagination be taken as indicating consciousness or a knowledge of his position on the part of a criminal; they are merely the movements which might be expected to take place in a muscle nerve preparation (*vide supra*, p. 263). It is true that clinically we meet with cases of persons who have broken their necks not only remaining conscious but even recovering;

but the circumstances are there very different to hanging, in which, by the drop, such extension is applied to the cord as to cause instant unconsciousness and death. The reports of post-mortems on hanged criminals usually include a statement to the effect that the neck was broken and death instantaneous: the injury to the spine does not always take place at the same point; fractures and dislocations about the third and fourth vertebræ (not far from the origin of the phrenic nerves) are as common, if not more so, than about the first and second.

6. **Combinations of the above.**—The facts of the findings in autopsies on persons who have been hanged warrant the following conclusions on this matter (*vide* Tidy, "For. Med.," p. 387):—

1. Given pressure both on the air tubes and blood-vessels, the pressure on the air tubes being only partial, death will probably result from a combination of asphyxia and apoplexy, but from asphyxia primarily. 2. Given a pressure in such a position that the air-way is more or less protected, death may occur from apoplexy, and will then be *slow*. 3. Given a complete pressure, so that the entrance of air into the lungs is entirely prevented, death will result from asphyxia, and will be *rapid*, and possibly even instantaneous.

7. **Death after Apparent or Temporary Recovery.**—It by no means follows that, because we have succeeded in restoring the respiratory process, a person is safe. Death often takes place by a relapse at various periods after the accident.

A boy, æt. 17, was found hanging. When cut down he was insensible, and his face livid; his lips were of a dark-purple colour, the pulse not perceptible, the pupils dilated and motionless. Artificial respiration was used, and in a quarter of an hour the diaphragm began to act. He breathed at irregular intervals with stertor, and with a rattling noise in his throat. The pulse became perceptible, but often flagging, and the surface of the body was cold. The countenance was still livid, but the pulse and breathing had improved. At the end of another hour an attempt was unsuccessfully made to take some blood from the arm, and the patient was placed in a warm bath. The breathing was stertorous through the night, and in the morning twelve ounces of blood were taken from the arm; but there was no relief. He continued insensible, and cold on the surface; there was frothing at the mouth, and he died twenty-four hours after he was cut down. The vessels of the brain were very full of blood—the only morbid appearance.

In another instance, a man who had hanged himself was cut down in a state of insensibility. He lay for a considerable time breathing with apopleptic stertor, but eventually recovered ("Brodie's Lect. on Pathol.," 72). A powerful, athletic man, who had been committed to prison for theft, hanged himself. He was found, apparently dead, hanging by his own handkerchief. He was cut down and seen half an hour after the occurrence. The man was then seemingly lifeless; he neither breathed nor moved, nor had any perceptible circulation. The face and neck were much swollen and livid, and the ecchymosed mark of the cord was immediately below the thyroid cartilage; the fingers were bent, and the hands nearly clenched. His head was raised; the windows were thrown open, and blood was extracted from the arm, which was put into hot water in order to increase the flow. In a few minutes the man began to breathe: the bleeding was allowed to continue until the pulse was felt at the wrist, and the pupils contracted completely on the approach of a light. The breathing was stertorous. Brandy-and-water was injected into the stomach, and warmth was applied to the extremities. In the course of a few hours he rallied; his pulse became firmer and quicker (130), but his head was hot; he was restless, unmanageable, and violently convulsed in the arms and legs. Shortly before death he was calm, and spoke several times: he suddenly became exhausted, and died nineteen hours after he was found hanging (*Lancet*, Jan. 6th, 1844).

This last case was probably a mixed case of asphyxia and congestive apoplexy. The unsuccessful result may perhaps be ascribed to the injury sustained by the cerebral circulation from constriction of the neck. In hanging as well as in drowning, therefore, a person may in the first instance recover, but subsequently die in spite of medical treatment, probably from the depressing effects produced on the nervous and muscular systems by the circulation of unaërated blood. A case in illustration of this point has been reported by Richardson (*Med. Times and Gaz.*, 1853, 2, p. 639). A man died on the second day after he was cut down. On inspection, the brain was found greatly congested, and there was effusion of serum under the arachnoid membrane. The lungs and heart were congested, and a solid fibrinous deposit was found in the right ventricle.

These cases offer one more illustration of the well-known fact that the precise cause of many deaths may remain undiscovered even by the most thorough examination of the body.

TREATMENT OF PERSONS HANGED.

The causes of death, as discovered by autopsy, give us some little guidance to the treatment we should adopt in endeavours to restore a person who is apparently dead from hanging.

The three cardinal principles are much the same as those in the apparently drowned, viz. :—

1. To induce the natural act of respiration.
2. To stimulate the heart into renewed action if it have ceased to beat, or to keep it beating if it have not ceased.
3. To maintain the natural heat of the body.

To promote the first object a current of fresh air is useful, as also the vapour of ammonia, or other sternutatories and artificial respiration (*vide supra*, p. 686) should be assiduously performed for a long time. Electricity to the course of the phrenics might possibly be of use. Obviously the ligature must be loosened, and the mouth wiped to remove all obstacles to the free entry of air; the tongue may also be pulled forward—the position of the body is here not nearly of so much importance as in drowning, *q.v.*, so that the body may be laid on its back.

The second indication may be fulfilled by mustard poultices to the cardiac region, to the calves of the legs, and elsewhere, and a vein should be opened to relieve as much as possible the venous stasis; a substantial amount of blood up say to a pint should be thus removed; but larger quantities are not required and may be dangerous. Hypodermic injections of ether or enemata of brandy are also useful for the purpose.

Friction, hot blankets, and the carrying out of the above efforts in front of a good fire fulfil the third condition.

The following cases are interesting :—

A robust woman, aged thirty-three, hanged herself while slightly intoxicated. She was missed about ten minutes before she was found suspended to a bedstead, but it was impossible to determine how long she had been thus hanging. Medical assistance was rendered to her in about ten minutes after she had been cut down. She was then quite insensible—her respiration slow and laborious, and her pulse barely perceptible. The countenance was pale; there was no lividity; the lower

jaw was depressed, the extremities moderately warm, the hands convulsively clenched, the pupils somewhat dilated and barely susceptible to light. A dusky-red mark, of a quarter of an inch in breadth, was observed encircling the upper part of the neck, forming an angle over the ramus of the jaw on the right side, where the knot of the ligature (a silk handkerchief) had rested; and in consequence of this the constriction was incomplete. The patient was twice copiously bled, mustard poultices were applied to the calves of the legs, hot water to the feet, and cold applications to the head. After thirty-two ounces of blood had been abstracted, in half an hour the breathing became stertorous, the pupils fully dilated, the lower jaw fell further, the sphincters became relaxed, and the patient appeared to be rapidly sinking. Ammoniacal liniment was rubbed on the chest, and the woman so far recovered in an hour as to be able to swallow; but although she was conscious of pain, she remained comatose until the evening, when she became perfectly sensible of surrounding objects.

This was evidently a case of imperfect suspension, where, from respiration still continuing, there was every hope of recovery. The cerebral circulation had here become simply disordered.

In one case *cold affusion* speedily resuscitated the person.

A man had been hanging about two or three minutes when he was cut down, and in four or five minutes afterwards he had ceased to breathe: his features were pallid, and the eyes injected with blood. The heart's action continued, although feebly; the pulse being about 80, and very weak. Artificial respiration was tried without any benefit, when affusion of cold water was resorted to. This, after a short time, led to the complete establishment of respiration: at each affusion there was a deep inspiration. The man was bled to sixteen ounces, and he soon recovered his consciousness (*Med. Gaz.*, vol. 37, p. 75).

When great cerebral congestion is produced by a close constriction of the throat, copious bleeding will generally be found beneficial.

Some Thugs, thus quite unintentionally, saved the life of a person whom they had strangled. A man fell in with a gang of Thugs, who strangled him. He became unconscious; on recovering his senses he found that his throat had been cut, and that a fellow-traveller lay strangled to death by his side. The wound in his throat was properly treated, and the man recovered in six weeks. He was able to give a description of the gang, which subsequently led to the apprehension of four of them, who were sentenced to death.

As Chevers remarks, it can scarcely be doubted that the violent measure of cutting the man's throat effectually relieved the vessels of the brain of any undue congestion which the throttling might have produced ("Med. Jurispr. for India," p. 405).

These cases bear out the views long since published by Brodie—namely, that after respiration has ceased, the heart continues to act, and to circulate venous blood, for a period of three or four minutes, to the brain and other parts of the system. The exact period of time will, however, depend on the strength of the person. It is on this ground that in hanging there is great hope of restoring a person by artificial respiration. Convulsions, paralysis, and even severe mental aberration have been observed to follow recovery.

POST-MORTEM APPEARANCES IN THE HANGED.

These may be divided into three groups :—

1. The general external appearances.
2. The general internal appearances.
3. The special examination of the neck.

General External Appearances.—The *external* appearances met with in the hanged have been generally taken by medico-legal

writers from those seen in the bodies of persons who have been judicially executed, or who have been violently hanged. Thus among them are the following :—Lividity and swelling of the face, especially of the ears and lips, which appear distorted; the eyelids swollen, and of a bluish colour; the eyes red, projecting forwards, and sometimes partially forced out of their cavities; the pupils dilated, the tongue enlarged, livid, and either compressed between the teeth, or sometimes protruded; the lower jaw retracted, and a bloody froth or frothy mucus sometimes escaping from the lips and nostrils. There are also, commonly, circumscribed patches of ecchymosis varying in extent, about the upper part of the body and the upper and lower limbs, with a deep livid discoloration of the hands; the fingers are generally much contracted or firmly clenched, and the hands and nails, as well as the ears, are livid; the urine and fæces are sometimes involuntarily expelled at the moment of death. Such appearances will rarely be found in those cases of suicidal hanging which are likely to come before a medical practitioner. In these, the face is generally pale. Esquirol found, in one instance, that when the body was examined immediately after death, the face was not livid; but it first began to assume a violet hue in eight or ten hours. The editor has seen a similar case. Esquirol thought that when the cord was left round the neck the face would be livid, but if removed immediately after suspension, pale. This view is not, however, borne out by observation. The *tongue* is not always protruded. Devergie found that there was protrusion of this organ in eleven out of twenty-seven cases. This protrusion was formerly supposed to depend upon the position of the ligature: thus, it was said, when this was below the cricoid cartilage, the whole of the larynx was drawn upwards, and the tongue carried forwards with it, while when above the hyoid bone the tongue was drawn backwards. The protrusion or non-protrusion of the tongue does not depend upon any mechanical effect of this kind, but simply upon congestion; for it is occasionally met with thus protruding in cases of drowning and suffocation. Besides, the protrusion has not been found to have any direct relation to the position of the ligature. Chevers has noted another characteristic external appearance after death from hanging, viz. that the saliva, after death, trickles from the mouth in a straight vertical line, down the chin and breast, and over the clothes.

There is another appearance on which a remark may be made—namely, the state of the *hands*. As a general rule, in violent hanging or strangulation, the hands are clenched. This appearance may not always be found, as it may exist and be destroyed before the body undergoes inspection. When the constriction of the neck has been produced suddenly, and with great violence, we may expect to meet with it. Thus it is found in the cases of executed criminals, and in strangulation attended with great violence, whether the act be due to homicide or suicide. In cases in which the constriction is gradually produced, the clenched state of the hands may not be found. Convulsions generally attend violent hanging or strangulation. The influence of these on the attitude or dress may not be apparent, unless the body be sitting or lying. It will be noted that none of these points are very characteristic of hanging, *per se*, but are rather suggestive of a violent asphyxial death.

The position of the body in its relative position to the head is perhaps the most important, thus owing to the relative position of fulcrum and weight, the head is usually bent forward on the chest and stiffened in that position. The early or late appearance of rigor mortis is quite immaterial.

The dribbling of saliva is also a matter of some importance, for as the secretion of saliva is a vital act, its presence in sufficient quantity to run down over chin and clothes is strongly suggestive of suspension during life, or at any rate immediately after death, for the secretion ceases very soon on cessation of circulation. A state of erection or semi-erection of the genital organs has also been frequently noted with or without expulsion of semen, but it has no great reference to the precise nature of the death, being found also in drowning, etc.

General Internal Appearances.—Internally we find the appearances described under "Asphyxia" (*supra*, p. 649), *i.e.* engorgement of the lungs and venous system generally with dark-coloured fluid blood: the lungs otherwise present no particular appearances. In one instance these organs were found quite collapsed, and occupying only the back part of the cavity of the chest. The right side of the heart, and the great vessels connected with it, are commonly distended with blood. But when the inspection has been delayed for several days, this distension may not be observed. When made before rigor mortis has set in, all the cavities of the heart may be found gorged with blood. The mucous membrane of the windpipe is more or less congested, and is sometimes covered with a fine bloody mucous froth. This may be owing to imperfectly obstructed respiration, and to spasmodic efforts at breathing. The vessels of the brain are generally found congested; and in some rare instances, it is said, extravasation of blood has been met with on the membranes, or in the substance of the organ. Effusion of blood is, however, so rare that Remer found this appearance described only once among one hundred and one cases; and in one hundred and six cases recorded by Casper it was not found in a single instance. In one case of death from hanging, Brodie found a large effusion of blood in the substance of the brain, and he refers to another case in which there was a considerable effusion between the membranes ("Lect. on Pathol.," p. 58). The venous congestion of the cerebral vessels is, however, rarely greater than in other cases of asphyxia, and is probably dependent on the degree in which the lungs have become engorged (*vide* above, "Modes of Death," p. 692). In most instances there is increased redness of the substance of the brain, so that, on making a section of the hemispheres, a greater number of bloody points (*puncta cruenta*) than usual will appear. The kidneys have been found much congested. A more important circumstance has been noticed by Yelloly—namely, that in examining the stomachs of five criminals who had been hanged, he found great congestion in all, while there was blood coagulated upon the mucous membrane in two. Such an appearance might, it is obvious, be attributed in a suspicious case to the action of some irritant substance. In the case of Good, who was executed for murder, the stomach was found on inspection to present over its whole surface a well-marked redness, resembling the effect produced by an irritant poison. The redness was especially observed at the pyloric end, where it assumed a somewhat striated character. In

another case, the stomach and intestines, especially the inner coat of the former, were much congested and inflamed, as if the man had died from poisoning. The contents of the stomach were analysed, but no poison found. Chevers, who quotes this case, states that he has more than once verified Yelloly's observation, and has found the mucous membrane of the stomach much congested in death from hanging ("Med. Jurispr. for India," p. 397). In November, 1903, the editor found this intense redness of the stomach very well marked in a man who had died in the London Hospital from caries of the spine, without any special circumstances to account for it. It is, therefore, not peculiar to hanging.

Special Examination of the Neck.—*A.* **Externally.**—It has been already mentioned that the head is commonly bent on the chest, though this of course varies with the position of the body in reference to the point of suspension and the position of the ligature. The neck in nearly all cases appears stretched, and will probably show the marks of the ligature. We say probably, because if a very soft ligature be used and the hanging period very brief, it is possible for there to be no mark at all. The actual **mark of the ligature** must be particularly and carefully noted in regard to depth, direction, number, colour, excoriation, ecchymosis, width, pattern, position above or below larynx.

Depth.—It is commonly depressed, as might be expected from the pressure produced by counterpoise of head and ligature. If the body is completely hanging, the depth is likely to be proportionately greater from the increased weight.

Direction.—The course of the mark is generally oblique, being lower in the fore part than behind, and it is often interrupted. If the noose should happen to be in front, the mark may be circular, the lower jaw preventing the ligature from rising upwards in the same degree in front, as it commonly does behind. Obvious deductions may be made from this as to how the body was suspended, or rather in what position; and it may be important in deciding between homicide and suicide.

Number.—If there is more than one distinct mark this must be noted for its bearing on 'homicide *versus* suicide.' An interrupted mark must not be mistaken for multiple marks: if the actual ligature is available, it may be applied to decide the point.

Colour.—It is frequently free from all traces of discoloration as the result of ecchymosis, the skin in the depression being then hard, brown, or of the *colour and consistency of parchment;* or there may be only a thin line of blue or livid colour in the upper or lower border of the depression, and chiefly in front. In some instances the mark, instead of being livid or brown, has presented itself simply as a white depression (*vide* "Hypostases and Pressure," p. 261).

Excoriation.—If the epidermis has been rubbed off, a parchmenty mark will be formed. This is very important as a guide to the nature of the ligature, and the degree of violence. Excoriation is quite commonly absent. The parchment appearance only comes on some hours after death.

Ecchymosis.—Actual bruising is not commonly met with in suicide, owing to absence of violence (*vide* below). The width and softness

of the ligature may also obviate ecchymosis; when present the ecchymosis is very seldom continuous all along the mark.

Width.—Has a very obvious bearing on the nature of the ligature, a piece of string, for instance, producing a narrow and deep depression, while a strap would produce a much wider one.

Pattern.—It occasionally happens that an actual pattern or impression of the material used is left on the skin. It is very important, therefore, to note if such be the case.

Position.—Medical jurists have considered it proper to inquire into the position of the cord or ligature, as this may sometimes form a question in cases of suspected murder by hanging. The following table will show that in more than two-thirds of all cases of *suicidal* hanging, the ligature is found encircling the neck between the chin and hyoid bone :—

	Remer.	Devergie.	Casper.
Above the larynx	38	20	59
On the larynx	7	7	9
Below the larynx	2	1	0
	47	28	68

B. **Internally or on Dissection.**—These consist of marks of rupture of internal blood vessels, ligaments, etc.

Ecchymosis.—It was formerly believed that the impression produced by the cord was invariably discoloured from effusion of blood, or ecchymosed, but more correct observation has shown that this condition is an exception to the general rule. When ecchymosis does exist, it is commonly superficial and of slight extent. There is rarely, if ever, effusion of blood in the cellular tissue. Riecke found only once in thirty cases an effusion of blood beneath and on both sides of the depression produced by the ligature. The tongue was generally between the teeth, and in most cases wounded by them. He attributed death to stretching of the spinal marrow (Henke's *Zeitschr.*, 1840, 27 Erg. H. 332). In the bodies of persons who have been judicially executed it is not unusual to find ecchymosis, but even here it is not always present. In a case which the author had an opportunity of examining, there was only a slight trace of ecchymosis in one spot where the knot in the cord had produced contusion. That it should occur in criminal executions is not surprising, considering the violence employed on these occasions, but it has been somewhat too hastily assumed that the appearances found in executed criminals are met with in all cases of death from hanging. Croker King, in examining the neck of an executed criminal, did not discover the smallest effusion of blood in the course of the cord, although in this case the body had been allowed to fall from a height of seven feet and a half, with a fearful jerk (*Dub. Quart. Jour.*, August, 1854, p. 86; and "Cases of Ruptured Intestines," 1855, p. 12). The theory of the production of ecchymosis has been carried so far that a *livid mark* in the course of the cord has been pronounced to be the best criterion for distinguishing hanging in the living from hanging in the dead body. It will be seen, however, that no reliance can be placed on this statement. In fifteen cases examined by Klein, in twelve examined by Esquirol, and in twenty-five

cases of suicidal hanging which Devergie met with (*op. cit.*, vol. 2, p. 394), there was no ecchymosis whatever in the course of the ligature ("Ann. d'Hyg.," p. 413; 1842, p. 146). Out of six cases, Fleischmann met with only one instance. In three cases of suicidal hanging which the author had an opportunity of examining, no ecchymosis had been produced by the ligature. In all these instances the skin, instead of being blue or livid, or presenting an effusion of blood in the cellular tissue beneath, was hard and of a yellow colour, resembling parchment. It had that appearance which the cutis commonly assumes when the cuticle has been removed from it two or three days before. On dissecting off the skin, the cellular membrane beneath often appears condensed, and of a silvery whiteness. Chevers states that in cases of death from hanging he has not met with any ecchymosis in the skin along the course of the mark (*op. cit.*, p. 406). The observations of Casper on this point are as follows:—Out of seventy-one cases, there was no ecchymosis produced by the cord in fifty, and thus in two-thirds of all the cases examined it was entirely absent. He also found that there was no difference in the appearance whether the ligature was removed sooner or later after death. Remer, on the other hand, considered ecchymosis, or a livid mark in the course of the cord, to be a frequent appearance in hanging, but Devergie properly objects to the inference drawn from the facts quoted (*op. cit.*, vol. 2, p. 397). Neyding, who examined fifty cases of death from hanging, published his observations on the special characters of the mark produced by the cord, in Horn's *Vierteljahrsschr.*, for 1870, 1, 341. His conclusions are, that it is rare to find ecchymoses in the mark on the neck. They are more frequently found in death from strangulation. The dryness and hardness of the mark depend chiefly on the abrasion of the skin. Microscopical congestions, or minute extravasations of blood, are, however, met with in the greater number of cases in the skin and cellular membrane in the course of the mark. These ecchymoses, in the opinion of that writer, will enable a medical jurist to say whether the hanging has taken place during life or after death; but his conclusions cannot be relied on as correct. Brenner has shown that the production of these microscopical ecchymoses depends on a variety of accidental circumstances, and they cannot aid in the solution of the question of hanging during life or after death (*Ibid.*, 1870, 2, 246).

The following singular case will show that the presence of lividity or ecchymosis in the mark does not depend, as Esquirol supposed, on the ligature being left around the neck.

A young man, in a fit of drunkenness, hanged himself with a stout cord. In about half an hour afterwards he was cut down, and attempts were made to resuscitate him. It was perceived that the cord had merely produced a superficial impression on the neck, destitute of any appearance of ecchymosis. Signs of returning life began to manifest themselves: the attempts at resuscitation were continued for several hours, but all signs of vital reaction disappeared; and now, when life was about to become again extinct, to the astonishment of those present, the mark on the neck, which had been hitherto colourless, became deeply ecchymosed. On an inspection being made the next day, it was found that this ecchymosis continued, and that it was owing to a real subcutaneous effusion. From the appearances in the head, it was concluded that the deceased had died from congestive apoplexy.

Casper regards the mark produced by the cord in hanging as a cadaveric appearance, and that it may become livid or dark-coloured after death, just as lividity appears in the dead body during the act of cooling ("Klin. Novellen," 1863, p. 493). This is probably the explanation of the observation above made; but at the same time it cannot apply to those cases in which, as by a blow, the small vessels in the skin are ruptured from a sudden fall, the rope acting by the weight of the body. In such a case, ecchymosis, arising from the effusion of blood in the course of the cord, must depend on the same causes as ecchymosis from blows in the living body.

Injuries to Arteries and Muscles.—Injuries to the muscles and deep-seated parts of the neck are, of course, only likely to be seen when considerable violence has been used in hanging. In several instances the lining membrane of the common carotid artery has been found lacerated. Friedberg, indeed, considers the injury to the carotid arteries to be a noteworthy point to be observed in cases of supposed death from hanging (Virchow's *Archiv.*, November, 1878). Armussat first drew attention to a case of hanging in which the inner and middle coats of both carotids were ruptured; and subsequently Devergie, Mildner, von Faber, Simon, Kussmaul, Hofmann, and Ogston published observations showing that injury to the carotid arteries is a valuable sign in hanging and strangulation. These arteries may be injured by the ligature when the artery is sufficiently stretched and squeezed. The injury consists partly in a rupture of the inner and middle coats, partly in extravasation of blood from the vessels of the walls of the carotid artery. Friedberg is of opinion that the stretching of the vessel has more to do with bringing about the lesion than the squeezing; and in support of this view adduces cases where the rupture of the arterial coats was situated at a distance from the site of the ligature. The sudden congestion brought about in the vessels above the ligature may also have to do with the causation of the lesion; and this congestion may be so great as to end in rupture, and extravasation of blood. The seat of the rupture is not always one or both common carotid arteries: the right external carotid artery was observed to be injured in a case of suicidal hanging, the ligature lying between the hyoid bone and the larynx. The stretching of the artery, fixed by the ligature, necessary for the rupture of the vessel, may be caused either by the drop suddenly increasing the pull upon the ligature through the weight of the body, or by the movements of the body directed towards freeing the neck from the noose. The rupture of the vessel may be produced by suspension of the corpse after death. But extravasation of blood, being a vital phenomenon, becomes a valuable sign pointing to suspension during life.

Injuries to the Spinal Column and Cord.—These are commonly found only in judicial hangings where a long drop is allowed. They might obviously occur in a determined suicide if he threw himself off a height after the application of a rope. Dr. Tidy remarks there is, however, no recorded case of suicide in which such results have occurred.

Fractures of Larynx and Os Hyoides.—Cases of this injury are recorded by various observers, but they are rare.

We must now consider the medico-legal questions that arise

in a case of hanging. These we shall consider in the following order:—

1. Was death due to hanging, or was the body suspended after death?
2. Was it accident?
3. Was it suicide or homicide?

WAS DEATH DUE TO HANGING, OR WAS THE BODY HUNG AFTER DEATH?

When a person is found dead and his body suspended, it may be a question whether death really took place from hanging or not. In investigating a case of this kind, it is necessary to draw a distinction between the *external* and *internal* appearances of the body. The former alone may be sufficient for returning an answer to this question: the internal appearances of the body will furnish the general signs of asphyxia, and enable us to say whether any latent cause of death existed or not. Both these points are of extreme importance, so that it must not be supposed that a most thorough autopsy can be dispensed with. The state of the countenance or skin, and the position of the tongue, will usually afford no evidence on the subject of death *from* hanging.

The Mark of the Cord.—Among the external appearances, it is chiefly to the *mark* produced by the cord on the neck that medical jurists have looked for the determination of the question. As the form, position, and other characteristics of this mark have been already described, it will now be necessary to allude to it only as furnishing evidence of life at the time of its production. It has been stated that, so far from being constantly livid or ecchymosed, this condition is, in reality, not seen in more that one-half of the cases which occur. But admitting that we find ecchymosis in the course of the ligature, are we always to infer that it must have been applied while the person was living? The case mentioned above (p. 701) proves that the presence of active life is not necessary for the production of an ecchymosis in the mark; and from the experiments of Devergie and Casper it would appear that if a body is hanged, immediately or a short time *after death*, an ecchymosed mark may be produced on the neck by the ligature. If a few hours were suffered to elapse, so that the body had become cold before suspension, no ecchymosis was produced by the ligature. Vrolik found, however, that a slightly livid mark was produced on the neck of a dead body, which had been suspended after the lapse of *an hour* from the time of death (Casper, *Wochenschr.*, February, 1838). Hence this condition of the mark in a body found dead merely indicates, either that the deceased must have been hanged while living, or very soon after death (*vide* "Wounds, Ante or Post-Mortem," pp. 436 *et seq.*). The circumstances that an ecchymosed mark may be produced by suspending a recently dead body bears out the statement of Merzdorff—that it would be in the highest degree difficult, if not utterly impossible, to determine medically from an inspection whether a man had been hanged while living, or whether he had been first suffocated and his body suspended immediately after death. In making this admission it is proper to bear in mind, that that which is

difficult to a medical jurist in confining himself to medical facts only, is often easily decided by a jury from these, together with the general evidence, laid before it.

Sometimes, besides ecchymoses, there are abrasions of the skin in the course of the cord, and these are known to have been produced during life by the effusion of blood which accompanies them. Devergie never met with this appearance in the dead body, even when the hanging took place immediately after death. The discovery of effused coagula in or about the spinal column would render it probable that the deceased must have been hanged while living. Such marks of violence are, however, rare in cases of hanging; and when they are found, it might be assumed that the effusion and coagulation of blood had been caused by violence offered to the neck *immediately after death;* but this assumption may be met by the question, why death by hanging should be simulated in the body of a person who is alleged to have died from another cause.

With regard to the other or more common kind of mark in suicidal hanging, it can scarcely be said to furnish any evidence in relation to the question which we are here considering. The depression may be hard and brown, although it does not usually acquire this colour until some hours have elapsed after death; for it appears to depend simply upon a drying of that portion of the skin which has been compressed or condensed by the ligature. Sometimes the upper and lower borders only of the depression present a faint line of redness or lividity; and it is worthy of remark, that when the ligature presents any knots or irregularities, those portions of the skin which sustain the greatest compression are white (*vide* p. 261), while those which are uncompressed are found more or less ecchymosed. It is in this manner that the form of a ligature is sometimes accurately brought out. It may be remarked of these depressions produced by the cord, that the characters which they present are the same, whether the hanging has taken place during life or soon after death: *i.e.*, the appearances may be similar in the two cases.

Effects of Hanging on the Dead Body.—The following are the results of experiments performed by Casper:—1. The body of a man, æt. 28, was suspended, *an hour* after death, by a double cord passed round the neck above the larynx. The body was cut down and examined twenty-four hours afterwards. Between the larynx and hyoid bone there were two parallel depressions, about a quarter of an inch deep, the skin having a brown colour with a slight tinge of blue, and a leathery consistency: in certain parts it was slightly excoriated. There was no effusion of blood beneath, but the muscles which had undergone compression were of a dark-purple colour, and the blood-vessels of the neck were congested. The appearance of the body was such, that any person unacquainted with the facts would have supposed, on looking at it, that the hanging had really taken place during life, for there was nothing to indicate that the body had been hanged an hour after death.—2. The body of another young man was hanged an hour after death, and an examination was made the following day. The two depressions produced by the double cord were of a yellowish-brown colour, without ecchymosis: the skin appeared as if it had been burnt, and felt like parchment.—3. The body of an old man, who had died from dropsy,

was hung up *two hours* after death. The impressions presented exactly the same characters as in the preceding case. (*Wochenschr. f. die G. H.*, Jan., 1837.) When the hanging took place at a later period than an hour after death, there was no particular effect produced. In other experiments, Casper found that the appearances of the neck of a corpse suspended seventy-two hours after death could not be distinguished from those presented by the body of a person who had committed suicide by hanging ("Klin. Novellen," 1863, p. 489).

We learn from these experiments, as well as from those performed by other observers, that the mark which is usually seen on the neck in hanging during life (non-ecchymosed) may be also produced by a ligature applied to the neck of a subject *within two hours*, or even at a later period, after death—consequently the presence of this kind of mark on the neck is no criterion whether the hanging took place during life or after death. The changes in the skin beneath the mark are also devoid of any distinctive characters: there is the same condensation of the cellular membrane whether the hanging has occurred in the living or dead body. These changes are the simple result of a physical cause—mechanical compression.

Summary of Medical Evidence from Cord Marks.—From the foregoing considerations we draw the conclusion that there is no distinctive sign by which the hanging of a *living* person can be determined from an inspection of the dead body. All the external marks may be simulated in a *dead* body, and the internal appearances furnish no characteristic evidence. Still, when the greater number of the signs enumerated are present, and there is no satisfactory cause to account for death, we have strong reason to presume that the deceased has died from hanging. We must not, however, abandon medical evidence on these occasions, merely because plausible objections may be taken to isolated portions of it. Facts may show that, however valid such objections may be in the abstract, they are wholly inapplicable to the particular case under investigation. Perhaps the greatest difficulties occur in reference to cases of *suicide*, owing to the slight appearances which attend this form of death; but on these occasions moral and circumstantial proofs are so generally forthcoming that a medical inspection of the body is often deemed unnecessary by a coroner. If, then, it is admitted by a medical jurist that it is not in all cases possible to distinguish hanging in the living from hanging in the dead, the admission must be considered as having reference to cases wherein persons destroy themselves, and not to cases in which they are destroyed by others. Even if a doubt were raised in any particular instance, it is more than probable that circumstantial evidence would furnish data for a decision, and thus satisfactorily make up for the want of strict medico-legal proof. If when we found a deeply ecchymosed or livid mark round the neck of a dead subject we said, all other circumstances being equal, that the person had most probably died by hanging, we should not be departing from a proper discharge of our duty; since, although it is medically possible that such a mark may be produced after death, yet, as it would be only a murderer who would think of hanging up a recently dead body to simulate suicide, in such a case there would be some obvious indications of another kind of violent death about the person. The absence of these, and the presence of ecchymosis in the course of the cord, would leave

the question of hanging during life settled in the affirmative. Some caution should be used in expressing an opinion that hanging took place after death, in cases in which there is no ecchymosis in the seat of the ligature; because, while such an opinion would be generally correct, it might in some instances lead to the concealment of the real mode of death. Many facts show that numerous cases of hanging during life would be pronounced to be cases of hanging after death, if the mere absence of ecchymosis in the course of the cord were taken as a criterion. The discovery of marks of violence about the person is not of itself sufficient to rebut the presumption of death from hanging on these occasions. The violence should at least be of such a nature as to account for the immediate destruction of life, or it can throw no light upon the question whether the person might not have died from hanging, in spite of the marks of maltreatment found upon the dead body.

If, in reference to a body found hanging, a medical jurist should assert that death had *not* taken place from this cause, this would be tantamount to declaring that the deceased must have been murdered—because it is difficult to suppose that any but a murderer would have any motive for hanging up a recently dead person. This hanging after death has been frequently carried out with a view of concealing the real mode of death, and of making the act appear to be one of suicide.

Violence or other Possible Cause of Death.—Much must here depend upon the medical man's knowledge of wounds and poisons being necessarily fatal; cases are very frequent indeed in which suicides have inflicted very serious wounds upon themselves and then completed self-destruction by hanging, so that hasty conclusions must not be drawn. This point furnishes an excellent illustration of the importance of what at first sight appears of mere academic interest, viz., what power the victim of a wound has after receiving it (*vide* pp. 444 *et seq.*).

The following cases admitted of no doubt:

A woman was found suspended to a beam in a barn. Owing to the absence of the usual marks of hanging about the face and neck of the deceased, a careful examination of the body was made. In the course of the inspection, a small penetrating wound, evidently inflicted by a round instrument, was discovered on the right side of the chest, but in great part concealed by the breast on that side. On tracing the wound, it was found to pass between the fifth and sixth ribs, completely perforating the heart from right to left. A considerable effusion of blood had taken place internally, which had been the cause of death. It was therefore evident, from the result of this inspection, that deceased had been killed, and her body suspended after death. (For a similar case, see Casper, *Wochenschr.*, February, 1838.)

Foderé refers to a case in which a person was found hanging under somewhat similar circumstances, and on examination it was discovered that death had been caused by the administration of poison—the body having been subsequently suspended. In one instance, Devergie discovered a quantity of plaster of Paris in the stomach and intestines of a person found hanging. There are, however, cases of this kind in which some embarrassment may occasionally arise. It may be a question whether the discovery of poison in the body of a person found hanging is consistent with a previous attempt at suicide by poison. A person has even been known to hang himself after swallowing a strong dose of prussic acid.

Richards, of Bancoorah, has communicated two facts which show

the importance of making post-mortem examinations of those whose bodies are found hanging. The first was the case of a woman whose body was found suspended. It was discovered on inspection that there was a rupture of the stomach, from which the woman had died. The body was hung up by the husband soon after death. In a second case, one Kuyra Khoyen confessed to having killed his wife by a blow with his fist, and afterwards hung the body up to simulate death by suicide.

Dribbling of Saliva.—We have already noticed this phenomenon in the external appearances as affording proof—strong in proportion to its quantity—that the body was suspended either during life or immediately after.

Was it Accident, Suicide, or Homicide?

Accident.—Of these three, accident is certainly by far the least common; we may dismiss it with a few examples without much discussion, inasmuch as the circumstances surrounding any such possible case are nearly certain to clear up the matter.

The death of Scott, the American diver, in 1840, shows how readily asphyxia may be induced by a slight compression of the throat, even when a person might be supposed to have both the knowledge and the power to save himself. This man was in the habit of making public experiments on hanging, and had frequently before gone through them without danger; but on this occasion it is probable that a slight shifting of the ligature from under the jawbone caused so much compression on the throat between the chin and larynx as speedily to produce asphyxia. No attempt was made to save him until it was too late, and he was not brought to a hospital until thirty-three minutes had elapsed. He was allowed to hang *thirteen minutes*—the spectators thinking that the deceased was only prolonging the experiment for their gratification. This case proves that, for a person to die by hanging, it is not necessary that the rope or ligature should completely encircle the neck. Cerebral congestion may take place under these circumstances, and thus lead to the suspension of respiration. (See "Ann. d'Hyg.," 1858, 1, 177.) The slipping of the ligature, or the means of suspension, behind the angles of the jaw, might suffice to compress the great blood-vessels of the neck, and thus bring on fatal apoplexy.

A girl of the age of thirteen years was hanged by accident. She was swinging in a brewhouse, and near the rope used by her for that purpose was another for drawing up slaughtered sheep. In the course of the exercise, her head got through a noose of this second cord, which pulled her out of the swing, and kept her suspended at a considerable height until dead. A child, ten years old, had been amusing himself in swinging, by fastening a piece of plaid-gown to a loop in a cord, which was suspended from a beam in the room. In the act of swinging he raised himself up and gave himself a turn, when the loop of rope suddenly caught him under the chin, and suspended him until life was extinct. Another boy who was in the room did not give any alarm for some time, thinking that the deceased was at play. The jury returned a verdict of "Accidentally hanged." A man who was in the habit of exercising himself in gymnastics on the rope was one morning found dead and suspended in his bedroom. The rope had passed twice round his body and once round his neck, whereby it had caused death, although the legs of the deceased were resting on the floor. There was no doubt that the deceased had been accidentally hanged.

These are a few among several instances, and it will be seen that the circumstances under which they occurred were sufficiently decisive of the manner in which the hanging took place. Indeed, circumstantial evidence must always suffice for the discrimination of accidental hanging.

In *Reg.* v. *Montague*, tried in 1892, Mrs. Montague, who, though apparently a strict disciplinarian, had no motive or intontion of hanging her child, was charged with causing its death by this moans. She had tied tho child's arms with a stocking fixed to a string, which in turn was fixed to a ring in a cupboard; in some very extraordinary way the stocking slipped up to and round the neck of the child. The absence of motive or intent to kill was considered by the jury such a strong point in her favour that they gave her the benefit of the doubt and reduced the charge of murder to one of manslaughter, for which she got a year's imprisonment; the jury decided thus that it was a case of accidental hanging.

The following extraordinary case is taken from the newspapers of August 26, 1904.

Alderman Hudson, chairman of tho Kursaal Committee of the Harrogate Corporation, was yesterday afternoon found dead near his residence. He was seen alivo the previous night at his garden-gate, smoking a cigar, and was discovered near a coppice drive, down the embankment of which he had apparently fallen, his neck becoming jammed between the forked branches of a tree and his legs suspended up the embankment. He could not extricate himself and was suffocated.

Suicide *v.* Homicide.

It is in deciding this point that the medical jurist's faculties will have their chief exercise, and to its solution must be gathered every little point. A witness must, however, remember that this is strictly a question for the jury. It is not for him to say whether a man has hanged himself or been hanged by others, but merely to state, when required, those *medical circumstances* which support or rebut one or the other presumption. The possible points in any given case may be very limited, but the following ones must be considered in a general survey of the question:—

1. Statistics.
2. Circumstantial evidence as to time and place, and opportunity.
3. The nature of the ligature and its method of application, knots, and turns in it, etc.
4. Wounds and other injuries.
5. Tying of the limbs or fixing of them.
6. Capability of self-suspension from corporeal deformity or defect.
7. Position of body.
8. Circumstantial evidence, including signs of a struggle.
9. The marks of the ligature.
10. General remarks on homicidal hanging.

1. **Statistics.**—These are interesting and possibly suggestive as far as they go. In the Registrar-General's report for 1901, the editor finds that there were, males 672, females 142, total 821 suicides by hanging, whereas of murders by suffocation (hanging as a form of murder does not appear at all) there were, males 11 (all under one month of age, and so presumably smothered), and females 6 (five under one month, and one two years old), a total of 17, not one of which can definitely be stated to be murder by hanging. The inference is that murder by hanging is very rare. Next to drowning the most common mode of

self-destruction is by hanging. Suicide by hanging has been known to take place at all ages, from boyhood to old age. The discovery of a person dead from hanging is presumptive of suicide, all other circumstances being equal. According to Indian authorities, by far the greater number of those who commit suicide destroy themselves by hanging. Beatson, of Dacca, says that, in his experience, suicidal hanging was so frequent that any other method of self-destruction was quite exceptional. Out of seventy-five cases of suicide which fell under his notice, sixty-four were by hanging, nine by drowning, and two by throat-cutting or poisoning. Chevers ("Med. Jurispr. for India") states that the criminals of that country are well aware of the great prevalence of suicide by hanging, and after destroying their victims by blows they are in the habit of suspending the bodies in order that the deaths may be attributed to self-destruction.

2. **Evidence of Time and Place.**—These are very obvious points in the case. A murderer is certainly very unlikely to choose either time or place at which he is liable to be interrupted or be overlooked by witnesses. A suicide might be equally careful, it is true, but there may then be other circumstantial evidence such as doors and windows locked and fastened on the inside, etc.

3. **Nature and Method of Application of Ligature.**—This is a very important observation to make. Suicides more frequently take the material that is most accessible, braces, handkerchief, etc., or there may be evidence to show where the material came from and how it reached its destination. There is, too, here room for evidence of premeditation in the fixing of the point of suspension. For the evidence derivable from knots and their nature, the number of turns in the ligature, etc., *vide* "Strangulation," *infra*, p. 741.

The two following cases are here to the point.

James Arthur Young, 26, arrested at Brighton on January 21st, 1904, on a charge of deserting his wife and children, committed suicide in a cell at Hove Police-station, by hanging himself with a piece of lining from his coat, which he suspended from the bell-handle. A verdict of suicide was returned, there being no evidence to show the state of the deceased's mind.

The other was in April, 1904.

Mrs. Harriett Elizabeth Parker, wife of a publican at Ramsgate, was found dead. Apparently she had hanged herself with a piece of tape upon a peg behind the bar door, the peg breaking after death.

4. **Wounds and other Injuries.**—So far as these concern actual death by hanging, they have been already noticed (*supra*, p. 706). For our present inquiry, the presence of marks of violence on the body of a hanged person is important, and it will therefore be proper for a witness to notice accurately their situation, extent, and direction. Having satisfied himself that they must have been received during life, he will have to consider the probability of their being of accidental origin or not. These marks of violence are not always to be regarded as furnishing unequivocal proofs of murder; for it is possible that they may have been produced by the person himself before hanging, and not succeeding in committing suicide by these attempts, he may subsequently have resolved to accomplish his purpose by suspending himself. Let the witness duly reflect on these circumstances before he allows his opinion

to implicate any suspected individual—let him consider that a hanged subject may bear the marks of a gunshot wound, his throat may be cut, his person lacerated or disfigured, and yet, before a suspicion of homicide is allowed to be entertained, it ought to be clearly shown that such injuries could not, by any probability, have been self-inflicted. The importance of observing caution in such a case will be still more manifest when there is no ecchymosis produced by the cord, and the face does not present the marked characters of hanging ("Ann. d'Hyg.," 1870, 2, 226).

Marks of violence on a hanged subject may in some cases be fairly ascribed to *accident*. If the person has precipitated himself with violence from a chair or table, he may have fallen against articles of furniture, and thus have caused lacerations and bruises. The rope may have given way, and the person in falling have injured himself; but he may afterwards have had resolution and power enough to suspend himself again. Such an occurrence may be rare; but when the presence of these injuries is made to form the chief ground of accusation against another person, their possible accidental origin ought not to be lost sight of by a witness. The falling of a body on a hard pavement may produce such accidental injuries as might be wrongly assigned to homicidal violence. In another part of this work (p. 257) a case of suicidal hanging has been noticed, in which there was a copious effusion of blood from injuries post-mortem. In death from asphyxia the blood remains fluid in the body longer than in other cases, so that accidental wounds after death may be attended with comparatively large effusions of blood. This is a condition also favoured by the general congestion of the venous system ("Ann. d'Hyg.," 1868, 2, 218). Severe injuries may be found on the head of the deceased, and yet these may not be inconsistent with suicidal hanging.

If we suppose the deceased to have been hanged in a state of intoxication or stupefaction, medical evidence alone will rarely suffice to determine the question of homicide or suicide. The absence of all marks of violence from the body might actually lull suspicion. On these occasions the hands of the deceased should be inspected, since it is with these that a person defends himself; and, unless taken unawares, it is almost certain, if the hanging were homicidal, that there would be traces of violence on these parts. The clothes would be torn and discomposed, and the whole appearance of the deceased would be that of one who had done his utmost to resist a violent murderous attack. There might be some injuries which could not be attributed to accident under the circumstances. Among these we may enumerate fractures, dislocations, deeply penetrating incised and gunshot wounds. The question is—Do these serious injuries necessarily establish homicide? The answer must be in the negative; although when fractures or dislocations exist there are strong grounds for suspicion.

Suicides, it must be remembered, are capable of making many attempts on their lives by various means.

A gentleman was found dead hanging. His dress was much disordered; and some blood, which had issued from a deep wound in the throat, was found scattered over the floor. From the facts proved there was no doubt that this had been an act of suicide, and that the deceased, previously to hanging himself, had first attempted to cut his throat. Had his body been found in an exposed situation, this wound in

the throat might have given rise to a suspicion of murder. A young man was found hanging in his bedroom, quite dead. He was suspended by his cravat, and his feet were within an inch of the floor. The door of the room was fastened on the inside, and it was proved that no one could have had access to it. An earthen pan was found near the bed, containing about a pint of blood, which appeared to have issued from a deep incision in the bend of the left arm of the deceased. The razor with which this had been inflicted was found on the mantelpiece.

It came out in evidence, that on the previous night the deceased had swallowed a quantity of arsenic, and had suffered severely from the effects of the poison, although at the time it was supposed that his illness was due to other causes. In this case there were three modes by which suicide had been attempted. The deceased had first taken poison, then wounded and afterwards hanged himself. There could be no doubt that death was caused by hanging. Had the body been found hanging in a suspicious locality, the circumstances might have created a strong presumption of murder.

A man was found hanging in a room by a cord attached to a nail in the ceiling. In the upper and fore part of the neck there was a deep wound, through which the cord had passed. A ladder was placed against the wall by the side of the body. About a pound of coagulated blood was found on the floor, as well as in different parts of the apartment, and some linen covered with blood was discovered near the body. In a table-drawer, in the apartment above, was found some cord sprinkled with blood, as if a bloody hand had been in contact with it. On the staircase between the two apartments there was no trace of blood. The deceased's apartment was secured on the inside by the door being bolted. The deceased's clothes were spotted with blood, and his hands were also bloody. The body externally did not present any ecchymosis or other mark of violence. The hands were likewise free from violence, the fingers contracted, and the nails blue. There were patches of cadaveric lividity scattered over the trunk, and the fæces had been discharged. The face had a slight violet tint, and the tongue, which had been forcibly compressed by the teeth, projected about an inch from the mouth. The wound in the throat was situated between the chin and hyoid bone, and extended from the angle of the jaw on one side to the opposite angle. It had penetrated through the mouth to the back of the throat, dividing only some small branches of the thyroideal artery, and had evidently been inflicted after several attempts, for its edges were irregularly cut. The cord, in passing through the wound, had lacerated and extended it at the two extremities. The vessels of the brain were filled with blood, the vertebræ of the neck were uninjured, and the stomach was free from any trace of poison.

The opinion given by Dégranges, from these data, was to the effect that the deceased had died from suicidal hanging. When we consider that in this case the deceased had laid open his throat as far as the spine, dividing the right superior thyroideal artery, by which so much blood had been lost that it was not unlikely he would have soon fallen into a state of syncope, it is remarkable that he should still have had sufficient presence of mind and muscular power to have done what the evidence shows he *must* have done—namely, to have placed a handkerchief on his wound to arrest the bleeding; to have gone upstairs to another room, and have searched in a table-drawer for the cord with which he intended to hang himself; to have placed a ladder against a wall, and to have made use of this for the purpose of fixing a cord to a nail in the ceiling—an act which could only be performed with great difficulty. When we reflect on all these circumstances, it does not appear extraordinary that the magistrate who ordered the examination should have been prepared to receive an account of the deceased having been murdered. Much, it is true, rested upon the moral and

circumstantial proofs; as, for example, on the previous state of mind of the deceased, and the fact of his room having been found secured on the inside.

Casper mentions a case in which a woman was found hanging in her room. Two penetrating wounds were seen on the left side of the chest; these had perforated the pericardium, and touched the surface of the heart, without entering its cavities. There was a basin of bloody water, and a bloody sponge, on the table; the right hand of the deceased was stained with dried blood, and the door and window were fastened on the inside. There was no doubt that this was a case of suicide, and that, after inflicting the wounds, the deceased had hanged herself. The mark on the neck was nowhere ecchymosed, but of a yellowish or parchment colour. There was nothing in the nature of the wound to have prevented self-suspension ("Ger. Leich.-Oeffn.," vol. 2, p. 89).

A woman committed suicide under the following circumstances:—She fastened a cord to the top of the bed-post, put her head in a noose while kneeling on the bed, made a deep wound in her arm with a razor, closed the razor, and put it aside. Becoming faint from loss of blood, she must have fallen forward, and the pressure of the cord on the neck caused death.

The remarks made relative to incised wounds will apply to gunshot wounds. A suicide may attempt to shoot himself; he may fail in the attempt, and ultimately hang himself. Any description of gunshot wound, provided it be such as to allow of a person surviving a sufficient time, may thus be found on a hanged subject, and yet constitute no proof whatever of homicide. If there are circumstances about the wound which prove that it could not have been self-inflicted, this of course will affect the conclusion; but when such circumstances are not met with, a medical jurist should say, in answer to inquiries respecting the origin of these wounds, that they may have been inflicted either by the individual himself or by *another*. There might be no medical facts which would directly establish either view. In one instance of suicidal hanging there were lacerated wounds upon the head, and a handkerchief was found blocking up the mouth. If, in any case, the wounds or injuries are of a mortal nature, and probably caused rapid death, the presumption of murder amounts almost to certainty; for who but a murderer would suspend the dead body of a person so wounded, *immediately* after death?

5. **Tying or Fixing of the Limbs.**—One or two points are worthy of notice in relation to this question. The hands or legs, but more commonly the former, have been found tied in cases of undoubted suicidal hanging ("Ann. d'Hyg.," 1832, 1, 419); and yet it has been debated whether it was possible for a person to tie or bind up his hands, and afterwards hang himself. It is unnecessary to examine the arguments which have been urged against the possibility of an act of this kind being performed; since, among many cases that might be quoted, two occurred in 1843, in London, where the persons died from hanging: the act was suicidal, and the hands were found tied, in both instances, with a handkerchief. A third case occurred at Worcester, in 1844, in which the deceased tied his wrists with a handkerchief; and secured to this were two flat-irons, in order to increase the weight. A remarkable case of suicide, in which the hands and ankles were tightly secured, has been published (*Med. Gaz.*, vol. 45, p. 388; see also cases in Guy's Hosp. Rep., 1851). In another case of suicidal hanging, a folded handkerchief was found pressed into the mouth and

nostrils. Suicides sometimes designedly arrange matters so as to create a suspicion of murder. A woman was found hanging to the branch of a tree—the feet not touching the ground. A bundle of decayed leaves was found projecting from her mouth, and a ticket was pinned to her right shoulder, on which there were the following words in pencil :—"Three of us have committed the murder. We found on her one dollar and fifteen groschen. She only prayed for her two children." There was not the slightest mark of violence or of anything like resistance on the body of the deceased, and a full investigation of all the circumstances led Heinrich to the conclusion that this was really an act of suicide, which the deceased had thus attempted to pass off as murder (Casper's *Vierteljahrsschr.*, 1866, 2, 70).

In one case a man succeeded in tying his arms together at the wrists, and then passed his lower limbs and body between the arms, so that the hands were now tied together over the buttocks. He then, by stepping on to a chair, passed his head through a noose, and hanged himself (see fig. 17, p. 201, Mann's "For. Med.").

These cases prove that it must not be too rashly assumed that a person was murdered simply because his limbs are tied. Full consideration must be given to the question of how they are tied—material, knots, etc., etc., before a definite conclusion is arrived at.

6. **Capability of Self-suspension from Corporeal Deformity or Defect.**—It has been a debated question whether *corporeal infirmity*, or some peculiarity affecting the hands, might not interfere with the power of a person to suspend himself. This question can be decided only by reference to the special circumstances of each case. In the case of the Prince de Condé, it was alleged that he could not have hanged himself, in consequence of a defect in the power of one hand: it was also said that he could not have made the knots in the handkerchiefs by which he was suspended. Allegations of this kind appear to have been too hastily made in this and other instances. A determined purpose will often make up for a great degree of corporeal infirmity; and unless we make full allowance for this in suicide, we shall always be exposed to error in drawing our conclusions. Blindness is no obstacle to this mode of perpetrating suicide; and in reference to *age*, suicide by hanging has been perpetrated by a boy of nine, and by a man of ninety-seven years of age.

7. **Position of the Body.**—It may be stated bluntly and at once that no evidence of any kind as to murder or suicide is derivable from the position of the body, though it has been contended that the *position* of the dead body may serve to distinguish suicidal from homicidal hanging. This point was strenuously argued on the investigation which took place relative to the death of the Prince de Condé in 1830. The case requires a brief notice here, as it involves two glaring errors in medical evidence on death from hanging: 1st, that a person cannot die from hanging when the body is in any way supported, and therefore that murder must have been perpetrated; 2nd, that in all cases of death from hanging the mark produced on the neck by the cord or ligature must be discoloured or ecchymosed. If not ecchymosed, it is assumed that death must have taken place from some other cause, and the body have been afterwards suspended for the concealment of crime.

On August 27th, 1830, the Prince de Condé was found dead in his bedroom partly dressed, his body being suspended from the fastening of the window-sash by means of a linen handkerchief attached to a cravat which he was in the habit of wearing. The engraving, fig. 29, will give an idea of the position in which the body was found. The head was inclined a little to the chest, the tongue was congested and protruded from the mouth; the face was livid, a mucous discharge issued from the mouth and nostrils, the hands were clenched, the toes of both feet touched the floor of the room, the heels were elevated, and the knees were partly bent forward. The point of suspension was about six and a half feet from the floor. The legs were uncovered, and had some slight abrasions upon them. There was a chair near the deceased. Five medical men—three of them eminent experts, Marc, Marjolin, and Pasquier—inspected the body, and found the usual appearances indicative of death from asphyxia. There were no marks of violence about it beyond those which might have been produced accidentally by the chair in the act of hanging.

Fig. 29.



Suicidal hanging. Case of the Prince de Condé.

There was no natural cause of death in the body, nor any appearance to indicate that there had been violent struggling or resistance on the part of the deceased. On the upper and lateral part of the neck there was a mark produced by the ligature, but no ecchymosis; and on the left side of the neck, corresponding to the knot of the cravat, there was a depression somewhat deeper ("Ann. d'Hyg.," 1830, 1, 157).

Fig. 30.



Suicidal hanging.

The case involves only the ordinary details of suicidal hanging. It was contended, however, that he had been strangled by assassins, and his body afterwards hanged. The characters presented by the mark on the neck, and the erect position of the body with the feet on the floor, were the chief medical points on which those who adopted the hypothesis of murder rested their case. The evidence derivable from the mark on the neck has been elsewhere considered (p. 718); and with regard to the erect position of the body, all experience is against those who would treat this as negativing suicidal hanging. In order that death should take place from hanging, it is not necessary that the body should be freely and perfectly suspended. In his report of the above case, Marc quotes a number of instances, and gives illustrations of death under these

circumstances. In one of them (fig. 30) a man committed suicide by hanging himself in a prison-cell. He was found quite dead, nearly in a sitting position, his heels resting on the floor and his body being only a foot and a half above it. Fig. 31 represents a man, æt. 40, who committed suicide by suspending himself from a hook above his bed. When found he was in a kneeling position—his knees being only eight or ten inches above the bed and his toes resting upon it ("Ann. d'Hyg.," 1830, 1, 201). Many cases have been since recorded in which death has taken place from hanging when the feet were in contact with the ground, or the persons were almost sitting or recumbent; these may be regarded as mixed cases of hanging and strangulation. The reports of eleven cases of suicidal hanging or strangulation gave the following results: in three the bodies were found nearly recumbent; in four in a kneeling posture, the body being more or less supported by the legs; and in four the persons were found sitting. In one case the deceased, a prisoner, was found hanging to the iron bar of the window of his prison, which was so low that he was almost in a sitting posture. The ligature which he had employed was a cravat, but (what was more remarkable in the case) the hands of the deceased were found tied by another handkerchief. The body was warm when discovered. There was no doubt that this was an act of suicide; yet, as the reporter of the case observes, had the body been found in an unfrequented spot, the discovery of the hands *tied*, if not the position, would have led to a strong suspicion of murder.

Fig. 31.



Suicidal hanging.

In his position the deceased had contrived to tie his hands together by means of his teeth ("Ann. d'Hyg.," 1831, 1, 196; 1832, 1, 419). Among the cases collected by Esquirol is the following:—A patient in La Charité was found one morning hanging by a rope which was attached to the head of his bed. He had fastened this by a loop round his neck, but his body was so suspended, that when discovered he was on his knees by the side of his bed. There are one or two similar instances related by the same author. Webb met with a case in which a man destroyed himself while lying at full length on a bed. His head was in a loop formed by a leathern strap fastened to the bedpost (*Med. Times and Gaz.*, 1852, 2, p. 137). A mechanic was found hanging in his room, with his knees bent forwards, and his feet resting upon the floor. He had evidently been dead for some time, since cadaveric rigidity had already commenced. The manner in which this person had committed suicide was as follows:—He had made a slip-knot with one end of his apron, and having placed his neck in this, he threw the other end of the apron over the top of the door, and shutting the

door behind him, he had succeeded in wedging it in firmly. At the same moment he had probably raised himself on tiptoe, and then allowed himself to fall. In this position he died. The weight of his body had already sufficed to drag down a part of the apron, for it seemed as if it had been very much stretched. The deceased was in the position in which the body of the Prince de Condé was found, and the depression produced by the ligature on the neck was, as in that case, nowhere ecchymosed. These facts, so far from being considered to negative suicide, were treated as in accordance with it. A lady, who had been for some time suffering from great depression, was found dead hanging by a long cloth to a closed door, over the top of which she had thrown the other end of the knotted cloth and then shut the door upon it. Casper reports an instance in which a man was charged with the murder of his wife because her body was found hanging in almost an erect position ("Ger. Leich.-Oeffn.," vol. 2, p. 92).

A man hanged himself by a silk handkerchief passed through a ring only twenty-six inches from the ground. Rake saw him a few minutes after he had been cut down: the body was quite warm. When first seen, the man was lying with his legs extended at full length; his handkerchief was drawn tightly round the throat by a slip-knot, and his face was directed towards the ground. Both hands were firmly clenched. There was a well-defined, nearly circular, and much-indented mark round the lower part of the neck corresponding to the ligature. The ligature was drawn so tightly at one or two points as to appear almost buried in the folds of the skin about the neck. There was much ecchymosis at various spots in the back of the neck, and some abrasion of the skin at two or three points. There was swelling, with great congestion of the face. There was no escape of blood from the ears. (For other cases, with illustrations of the positions of the body, see Tardieu, in "Ann. d'Hyg.," 1870, 1, 94.)

Three additional cases occurred at the General Asylum for Lunatics, Northampton, in 1852.

In the first, the man made a loop of a twisted blanket at a height less than five feet from the ground, and then kneeling forward, strangled himself, the feet being on the ground and the knees nearly touching it. The fingers were neither clenched nor contracted, but partially bent. There were no marks of any convulsive struggle except a slight bruise on the wall. In the second case the man hanged himself on a beam: the legs touched the ground—the hands were not clenched. In the third, the patient had hanged himself by mounting on a shelf in a loft, fastening his neck-handkerchief to a beam, and then swinging himself off. He was found with his right leg suspended in the air, whilst his left leg was supported by the shelf on which he had been standing. His right hand was convulsively clenched, which is said to have been a habit on the part of the deceased; the left hand was open, and the fingers only slightly bent.

Remer found that, out of one hundred and one cases of suicidal hanging, in fourteen the body was either standing or kneeling, and in one instance it was in a sitting posture. Duchesne published an account of fifty-eight cases in which the suspension of the body was partial—the feet or trunk being more or less supported. Twenty-six of these were new cases. The reporter drew the conclusion that *suicide* by hanging is consistent with *any posture* of the body, even when resting upon the two feet ("Ann. d'Hyg.," October, 1845, 2, 141 and 346). Further evidence need not be adduced to show how unfounded is that popular opinion which would attach the idea of homicidal interference to cases in which a body is loosely suspended, or in which the feet are

in contact with any support. We ought rather to consider these facts as removing a suspicion of homicide; for there are probably few murderers who would suspend their victims, either living or dead, without taking care that the suspension was not partial, but complete. Besides, the facts of many of these cases are readily explicable; thus, if the ligature is formed of yielding materials, or if it is only loosely attached, it will yield to the weight of the body after death, and allow the feet to touch the floor, which they might not have done in the first instance. If there is reason to believe that the body has not altered its position after suspension, we must remember the rapidity with which insensibility comes on, and death commonly ensues, in this form of asphyxia.

8. **Circumstantial Evidence including Signs of a Struggle.**—In all doubtful instances we should not lose sight of circumstantial evidence. We should observe whether the doors and windows of the apartments had been secured on the inside or on the outside; whether the dress of the deceased is at all torn or discomposed, or the hair dishevelled; whether the attitude of the body is such as to show interference after death; whether there are marks of blood about the body, on the ligature, or in the room; whether the hands are bloody, or present marks of wounding or struggling; whether the rope or ligature corresponds to the impression seen around the neck; and lastly, whether the cord is of sufficient strength to support the weight of the deceased. The strongest evidence of homicide is often found in the attitude and the state of the dress of the dead body; it may or may not indicate interference or change after death irreconcilable with the supposition of death from suicide or accident. On this point the minutest circumstance may become of considerable importance as medical evidence. When there are indications of violent struggling, the dress may be found disordered, unless it has been smoothed or arranged by the murderer after the death of the deceased. There may, of course, be no evidence of disorder or discomposure of the dress when the body is fairly suspended. These points fall, it is true, more within the province of the officers of justice than of a medical practitioner; but the latter is generally the first who is called to see the deceased, and therefore, unless such facts are noticed by him on his visit, they may often remain altogether unknown. The medical opinion of the actual cause of death, however, must be based on *medical* facts alone. But circumstantial evidence has on various occasions assisted in clearing up a doubtful case. Louis states that, on removing the body of a man who was found hanging, the rope was observed to be stained with blood. This simple circumstance led to further investigation, by which it was discovered that the person had been murdered, and his body afterwards suspended. The presence of such marks on the neck indicative of strangulation as the cord was not likely to have produced may lead to a suspicion that the hanging followed death.

A boy was found hanging, perfectly dead. A round ecchymosed mark, about the size of a dollar, was seen on the fore part of the neck; and near it were several impressions, as of fingers and nails, in the surrounding skin. There was neither depression nor ecchymosis in the course of the cord. The inspection left no doubt that the deceased had died from asphyxia. The boy had been first strangled, and afterwards hanged. The body of a man was found hanging in a room; it was so

suspended from a hook that the trunk was not more than nine inches from the floor, and the legs were stretched out at length. The cord was from two to three feet long, and but loosely passed round the neck. The furniture of the room was in great disorder, and some marks of dry blood were seen on one part of the floor. The right side of the head and face presented several excoriated and ecchymosed marks. There was a circular impression around the neck produced by the cord, but it was free from ecchymosis. On the left side, a little above this impression, there was a strongly ecchymosed mark, which could be traced round to the back of the head. Blood was found effused beneath this mark. The lungs presented the appearances of asphyxia, but the examiners referred this to strangulation, and not to hanging, considering that the body had been suspended after death in order to simulate suicide.

The circumstances of the case appear to have fully justified this conclusion (see the case of Pinckard, "Strangulation," *infra*, p. 738; and for another, in which some doubt existed whether the deceased had died by hanging or strangulation, see Eulenberg, *Vierteljahrsschr.*, 1872, 1, 199, 216).

In this connection sight must not be lost of the peculiar tricks of lunatics, who will occasionally throw a room into great disorder before committing suicide, and, moreover, as they may have made an attempt (previous to hanging) by cutting, blood may be scattered about the room; every little point then about the amount and nature of such stains may be important.

9. **The Marks of the Ligature and Injuries to the Neck.**—Some medical jurists have thought that the *mark* left by the cord on the neck would serve as a criterion of murder on which we might depend. Thus it has been said, if the mark is circular and situated at the lower part of the neck, this is an unequivocal proof of murder. In hanging, the mark of the cord is generally *oblique*, being higher at the back part of the neck, in consequence of the loop formed by it yielding more in this direction than in front. But it is an error to suppose that this want of obliquity in the impression can afford any evidence in favour of the act having been homicidal. Its form will depend in a great degree upon the fact of the body being supported or not, for it is the weight of the body which causes its obliquity; it will also depend on the manner in which the cord is adjusted. A case of suicidal hanging is related by Orfila in which the mark of the cord extended horizontally round the neck from behind forwards ("Méd. Lég.," 2, p. 376). The slip-knot of the cord was in front of the neck, and it is obvious that when the cord is thus adjusted by a suicide, there will be scarcely any obliquity in the depression produced by it. A circular mark is not inconsistent with death by hanging as the result of suicide. A case of this kind, which created some doubt, as the person at the time was suffering from typhus fever, occurred to Frölich. It was a question, from the course of the mark on the neck, whether death took place from hanging or strangulation (Horn's *Vierteljahrsschr.*, 1869, 2, 57). Equally ill-founded is the assertion of Mahon, that the existence of *two impressions* on the neck affords positive proof of homicide. One of these impressions may be at the lower part of the neck, and circular—the other at the upper part, and oblique; it is therefore contended that the deceased must have been strangled in the first instance, and afterwards hanged. The possibility of a prior attempt being made by a suicide to strangle himself, and thus produce

the mark, is overlooked. There are facts on record to oppose to this very positive statement.

A case reported by Esquirol is that of a female lunatic who committed suicide by hanging herself, and on whose neck two distinct impressions were seen—the one circular, the other oblique. These appear to have arisen from the cord having been passed twice round the neck, the body being at the same time partially supported.

In some instances a presumption of homicidal interference may exist if there are two distinct impressions, but it cannot be admitted that they establish the fact of murder. A woman was found hanging to the branch of a tree, the feet resting on the ground. There were two marks on the neck, one like that of strangling with the same ligature as that by which the body was hanging. Walter concluded that the mark produced by the suspension of the body was the result of post-mortem hanging after murder by strangulation (*Vierteljahrsschr.*, 1867, 1, 161). In the same journal for 1871, 2, 223, a case is reported by Maschka in which a boy, æt. 9, was found hanging. There were marks of pressure on the neck which at first led the examiners to draw the inference that the boy had been strangled, and afterwards hanged. The reasons for this opinion were not satisfactory, and suicide was admitted to be not only possible but probable.

The injury done to the neck by the cord or ligature can rarely afford any clue to the manner in which hanging took place, unless the circumstances under which the body is found favour the presumption of homicide or suicide. Thus the laceration of the muscles and vessels of the neck, the rupture of the windpipe, and the displacement of the larynx, the stretching of the ligaments of the spine, and effusion on the sheath of the spinal marrow, may be observed in suicidal as in homicidal hanging. The presumption, however, is obviously in favour of the latter when these violent injuries are found to be accompanied by fracture or displacement of the vertebræ of the neck, and the body of the deceased is not corpulent, the ligature by which he is suspended is not of a nature likely to produce them, and the fall of the body has not been great. As a rule, a long fall in suicidal hanging is rare. Clegg, of Boston, held an inquest in a case of suicidal hanging in which the deceased had fixed the rope to the top of a beam in a lofty barn, and gave himself a drop of about fifteen feet. The face of the corpse had an expression of the most horrible agony, and the tongue was protruded and bitten.

Injury to the Vertebræ of the Neck.—A much-disputed question has arisen in medical jurisprudence whether the vertebræ of the neck can become fractured or displaced in *suicidal* hanging. Most medical jurists deny the possibility of this accident occurring—the displacement or fracture of these vertebræ being only observed, even in criminal executions, when a long drop has been used by the executioner. The author was not aware of any case of *suicide* on record in which such an injury to the neck has been found. A case referred to by Petit, which was left to the decision of Pfeffer, is unsatisfactory, because the body was not examined; and it is doubtful whether the act was really one of suicide or not.

Ansiaux, in inspecting the body of a woman who had hanged herself, found extravasated blood behind the first two vertebræ of the neck, which were more

widely separated behind than usual. On removing these vertebræ the posterior ligament of the spine was found ruptured, and the transverse ligament of the first vertebra (atlas) so stretched that the process of the second was completely blocked against the articular surface. The perpendicular and oblique ligaments were entire. The deceased was a stout, healthy woman; when discovered, her body was suspended from a beam, the feet being about a foot and a half from the floor. She had evidently fallen with considerable force.

This case will serve to show that severe injury to these deep-seated regions of the neck may be occasionally met with in suicidal hanging.

A woman, æt. 50, worn out and exhausted by disease, was found hanging quite lifeless from the rail of a bed, which was not more than five feet eight inches from the ground. The front of her body was turned round towards the bed, the head thrown forcibly backwards—the knot of the ligature, an old silk handkerchief, being placed in the middle of the under-side of the chin. Her heels were about three inches from the ground—the knees being on a level with the bed-frame, and resting against it. The body was seen by a medical man about an hour after it was cut down. The features were calm, and there was no trace of congestion about the face, which was pale, and in all respects natural. There was no lividity; the eyes were neither injected nor prominent; the tongue was pale, lying far back in the mouth, and without any mark of indentation from the teeth. The cord-mark was well defined, of a parchment colour, dry, brown, and hard, without any ecchymosis, but with a thin line of congestion at the upper edge of the groove; it was very deep at the back of the neck over the first vertebræ or atlas, probably owing to the head hanging backwards. The mucous membrane of the stomach was pale, the lungs natural; there was no congestion of the large veins or of the cavities of the heart, and each ventricle contained about an equal quantity of blood (*Lancet*, August 10th, 1844).

These appearances show that death was not caused either by asphyxia or by cerebral congestion. Neither the windpipe nor the great vessels of the neck could have sustained any pressure or constriction. The deep muscles over the second and third vertebræ of the neck were ecchymosed; this ecchymosis extended to the sheath of the spinal marrow; and on the left side, and externally to the sheath, there was a large effusion of firmly coagulated blood. There was no displacement of the second or other vertebræ, and the ligaments were sound; but between the third and fourth vertebræ there was unusual mobility, as if they had been stretched. In this case the body was not heavy, and the fall, if any, could have been but trifling. The effusion on the spinal marrow was the cause of death; and its origin was sufficiently explained by the falling back of the head and sudden bending of the vertebræ of the neck. Her husband and family were in an adjoining room, but heard no noise; it was only by accident that the deceased was discovered.

For further remarks *vide* "Strangulation," *infra*, pp. 732 *et seq.*

10. Difficulties in Homicidal Hanging.—It has been truly observed that of all the forms of committing murder, hanging is one of the most difficult, and it is therefore but seldom resorted to. In most cases, when a person has been hanged by others, it has been after death, in order to avert a suspicion of homicide. Hence the discovery of a body hanging affords *primâ facie* evidence of suicide, supposing it to be certain that death has taken place from this cause. We must, however, admit that a man may be murdered by hanging, and that the appearances about his body will not afford evidence of the fact. The circumstances which will justify a medical jurist in making this

admission are the following:—1st. When the person hanged is feeble and the assailant a strong, healthy man. Thus a child, a youth, a woman, or a person at any period of life worn out and exhausted by disease or infirmity, may be destroyed by hanging. 2nd. When the person hanged, although usually strong and vigorous, is at the time in a state of intoxication, stupefied by narcotics, or exhausted by his attempts to defend himself. 3rd. In all cases murder may be committed by hanging when many are combined against one person (*e.g.*, lynching). With these exceptions, then, a practitioner will be correct in deciding, in a suspected case, in favour of the presumption of suicide. Unless the person laboured under stupefaction, intoxication, or great bodily weakness, we must expect to find, in homicidal hanging, marks of violence about the body; for there are few who would allow themselves to be murdered without offering some resistance—notwithstanding the assertion of Mahon, that some might submit to this mode of death with philosophical resignation when they saw that resistance was hopeless. The following singular case of attempted murder by hanging is mentioned in "Symes's Justiciary Rep." (Edin., 1827).

A woman, æt. 69, was charged with attempting to hang her husband, who was some years older. It appeared that the accused contrived to twist a small rope three times round the neck of her husband, while he was lying asleep. She then tied him up to a beam in the room, in such a manner that when the neighbours entered he was found lying at length on the floor, with his head raised about one foot above it. He was insensible; his hands were lying powerless by his side, his face was livid, and it was some time before he could be roused. Had he remained longer in this position he would have died. According to his statement, he went to bed sober, and he was not aware of anything which had passed during the attempt to hang him or afterwards, until he was resuscitated. The prisoner was convicted of the assault without previous malice, she having no ill-will against her husband, and being herself at the time intoxicated.

It can hardly be considered possible that any man should be so sound asleep as not to be awakened by the attempt thus made to hang him. The probability is that the prosecutor was, like his wife, intoxicated and helpless. A case of alleged murder by hanging, and of considerable difficulty in its medical relations, was tried at the Exeter Sum. Ass., 1851 (*Reg.* v. *Rowe*). Although the prisoner was acquitted, there were some facts leading to the belief that this could not have been an act of suicide.

In 1888, a man named Eyraud, and a woman named Bompard, succeeded in hanging a man named Gouffé. The victim was enticed into an alcove for the purpose of an interview with Bompard, who had been his mistress. In the alcove Eyraud was stationed behind a curtain, and a compound pulley with a rope and hook was so fixed that whilst Gouffé was sitting on a sofa with Bompard on his knee, she passed a silken cord round his neck, and then passed the free end of the noose, which was provided with an eye, to Eyraud, who slipped it over the hook and hoisted up Gouffé ("Arch. de l'Anthropologie," 1890, Mann's "For. Med.," p. 197).

SUB-SECTION C.—STRANGULATION.

DIFFERS FROM HANGING.
DEFINITION OF STRANGULATION.
SYMPTOMS OF STRANGULATION.
CAUSE OF DEATH IN STRANGULATION.
TREATMENT OF THE APPARENTLY STRANGLED.
POST-MORTEM APPEARANCES IN THE STRANGLED.
WAS DEATH DUE TO STRANGULATION?
WAS IT ACCIDENTAL?
WAS IT SUICIDAL OR HOMICIDAL?

HANGING and strangulation were formerly treated together, and some medical jurists have admitted no distinction in the meaning of these terms. In hanging the phenomena of asphyxia takes place in consequence of the *suspension* of the body, while in strangulation asphyxia may be induced not only by the *constriction* produced by a ligature round the neck independently of suspension, but by the simple application *of pressure* (throttling), through the fingers or otherwise, on the windpipe. There can, therefore, be no doubt that the two should be kept distinct, for while the proof of death from hanging leads to the strongest presumption of suicide, the proof of death from strangulation is equally presumptive of murder.

DEFINITION OF STRANGULATION.

As noted above, then, strangulation may be defined as an act of violence whereby constriction is applied to the neck (air-passages and blood-vessels) by some other means than the weight of the victim's body.

SYMPTOMS OF STRANGULATION.

So far as these can be said to exist they have already been described under "Symptoms of Hanging," *q.v.*, for in all experiments on that subject the *symptoms* were produced by violence amounting to pure strangulation.

When it is remembered that a person can voluntarily hold his breath for, say, at least thirty seconds, it is very remarkable that a sudden and violent compression of the windpipe should render a person powerless to call for assistance or to give alarm, and cause almost immediate insensibility and death, without convulsions, which it undoubtedly does, as is shown by the old criminal practice of garrotting, and also in many of the cases below, and seems to prove that death is not, invariably and altogether, a matter of pure asphyxia.

With incomplete closure of the windpipe, convulsive movements sometimes occur. Occasionally there has been bleeding from the ears, nostrils, mouth, and throat. The face usually becomes in the first instance black. The hands are clenched. As a rule insensibility is so rapid that there is no pain.

CAUSE OF DEATH IN STRANGULATION.

In hanging we have seen that there is probably more than one method by which death may occur. In strangulation, too, the fact mentioned above of *sudden* death certainly suggests that shock or some nervous influence may play a part; but for all that it is generally assumed that the cause of death in strangulation is really asphyxia; the rapidity with which it takes place will depend on the degree of pressure, and the completeness with which the act of breathing is obstructed.

Faure applied a ligature forcibly and suddenly to the neck of a middle-sized dog. For fifty-five seconds the animal did not appear to suffer; but it suddenly became violently agitated, the body stiffened, and it rolled convulsively on the ground. A bloody froth issued from the nostrils and throat, and frequent and violent efforts were made to respire. In three minutes and a half it was dead. In a second experiment an elastic tube, which admitted of being gradually closed by pressure, was introduced into the windpipe. The animal could bear the pressure up to the reduction of one-half of the calibre of the tube, but beyond this it suffered greatly, and when the pressure was increased there were convulsions. The dog died, in great suffering, before the tube was completely closed ("Ann. d'Hyg.," 1859, 1, 122). It is probable that human beings die more quickly than animals, especially from the effects of manual strangulation.

TREATMENT OF THE STRANGLED.

Inasmuch as strangulation is almost invariably homicidal, it is but very rarely that treatment can be considered; should an opportunity for it occur, the same principles must be carried out as in a case of hanging, *q.v.*, p. 695.

If the body be cold, hot bottles with rubbing, and sometimes venesection should be adopted. The subsequent treatment must depend on whether pneumonia, or the local injuries to the neck and other parts, or the effects of shock, etc., have to be combated.

If no injury has occurred to the neck, there is a good chance of life, provided treatment be adopted within five minutes.

The after-effects of strangulation, that is, supposing the first effects be recovered from, are often serious. In addition to convulsions and an extreme swelling of the neck, lower part of the face, and upper part of the chest, there may be pulmonary and laryngeal troubles, together with the formation of abscesses and bed sores, whilst death may occur unexpectedly and at a period somewhat remote from the attack.

POST-MORTEM APPEARANCES IN THE STRANGLED.

As in the hanged, these may be divided into—

The general external appearances.
The general internal appearances.
The special dissection of the neck.

General External Appearances.—These are ordinarily very much the same as in hanging, with the rather important exception that the superficial signs of asphyxia are usually better marked. The face may be livid and swollen, the eyes wide open, prominent, and congested, the pupils are dilated, the tongue swollen, dark-coloured and protruded; it is sometimes bitten by the teeth, and a bloody froth escapes from the mouth and nostrils. These external signs of violent death may, however, be entirely absent, with nothing but a slight dusky or leaden hue about the lips, or even a pallid appearance. Tardieu has described another appearance which might be overlooked. This consists in the presence of numerous small spots of ecchymosis upon the skin of the face, neck, and chest, as well as in the conjunctivæ or membranes of the eyes. These parts present a dotted redness, which has, however, been met with in other cases besides death from strangulation ("Ann. d'Hyg.," 1859, 1, 125). In cases in which great violence has been used to the neck, blood may escape from the mouth and nose. In *Reg.* v. *Millar* (C. C. C., July, 1870), the prisoner was charged with the murder of a Mr. Huelin. One of the circumstances which led to the discovery of the crime was the large amount of blood which had escaped from the mouth and nose as a result of the act of strangulation. The evidence left it clear that the prisoner had murdered Huelin and his housekeeper, and had endeavoured to conceal the dead bodies. He had packed the body of the housekeeper in a box, and requested a carrier to place a cord round it. The man observed that fluid blood was oozing from the box, and that there was a large stain of blood on the floor beneath. On opening the box, the body of the woman was found inside. There was a cord tightly tied round the neck of the deceased, and blood had escaped from the mouth and nose, and had run down the side of the box. The deceased had been strangled, and such an amount of force used in the tightening of the cord round the neck as to lead to a copious effusion of blood from the mouth and nose. In cases of asphyxia, as it has been elsewhere stated, the blood, owing to its liquidity, continues to flow for some time after death from any lacerated wound or blood-vessel. In some instances of strangulation, blood has escaped from one or both ears during the act; but this is not a usual appearance. In two well-marked cases, the constriction was carried to a great degree, but there was no bleeding from the ears. Geoghegan met with one instance of *suicidal* strangulation, which he examined; the constriction had been produced by a riband, and the violence applied was sufficient to produce bleeding from one ear: on dissection this was found to have resulted from a rupture of the membrane of the drum of the ear. There was no froth at the mouth or nostrils, and scarcely any lividity or swelling of the face. It was further observed that the mark on the neck, which was deep, almost disappeared on the removal of the ligature. Wilde met with a case in which rupture of the

membrane of the drum of the ear, with effusion of blood, was caused by strangulation. Bleeding from the ears, as a result of rupture of this membrane, must, however, be regarded as an exceptional appearance. Chevers does not mention it as having been noticed in any one of the numerous cases which he has collected in his Indian experience, although bleeding from the nostrils had been observed ("Med. Jurispr. for India," 1856, p. 374). Without rupture of the membrane of the drum, blood could not [this is doubtful—Ed.] issue from the ears, and, in order that this membrane should be ruptured, certain conditions not commonly met with are required. The general lividity of the body, with the clenching of the hands and swelling and protrusion of the tongue between the lips, are generally more marked in strangulation than in hanging. A thin mucous froth tinged with blood is occasionally found in the air-passages in both cases. It has also been stated that a congested state of the sexual organs both in males and females was one of the appearances connected with strangulation, but this has not been confirmed. Tardieu met with nothing to call for notice in this respect in the numerous cases which he examined. The involuntary discharge of fæces, urine, and seminal fluid, described as one of the characters of death by hanging, may equally occur in death from strangulation. No importance can be attached to this as a sign of death from asphyxia in any form. It frequently occurs in sudden and violent death from any cause, and there are many instances of death from asphyxia in which it is not observed.

General Internal Appearances.—In the case of a woman who had been homicidally strangled, the body presented the following appearances. The skin of the head, face, neck, and chest was darker than natural, and discoloured underneath, particularly on the scalp. The brain was suffused with dark blood, the lungs gorged and of a dark hue, the bowels of a dusky-red colour. The eyes were somewhat protruded and bloodshot, the lips swollen and darker than natural, the tongue slightly protruding between the teeth, and froth issuing from the nostrils. There was a mark of pressure behind the right ear, and other marks on the neck and chest, with discoloration of the muscles (Chevers's "Med. Jurispr. for India," pp. 378, 387). In a case of suicidal strangulation, the body of the deceased was found dead, cold, and rigid about seven hours after he had been seen alive. The arms were flexed, and the hands raised a little above the breast. Round the neck, just below the cricoid cartilage, was a strip of the deceased's shirt, which had been used as a ligature : it was tied at the *back* of the neck. There was a slight ecchymosis in the mark beneath. The face had a dark-red colour dotted with spots of a deeper red. The conjunctivæ were ecchymosed, and some blood had escaped from the nose. The brain was congested, and much fluid effused. The heart was empty; the lungs were deep in colour (congested) (*Med. Times and Gaz.*, 1863, 2, p. 183). The most complete account of the appearances is that given by Tardieu. It is based on observations made in twenty-eight inspections ("Ann. d'Hyg.," 1859, 1, 132). The lining membrane of the larynx and windpipe was more or less reddened from congestion ; sometimes it was livid or of a dark-red colour. There was a bloody froth extending into the air-tubes. The state of the lungs was variable. Contrary to what is generally alleged to be characteristic of

death by asphyxia, Tardieu found these organs to contain but little blood. Sometimes they were congested, at other times normal. There were ruptures of the superficial air-cells producing patches of emphysema, which were seen singly or in groups. This condition, which was rarely absent, gave to the surface of the lungs the appearance of being covered with white layers of thin false membrane. When these patches were punctured, air escaped. There was an absence of that condition of the lungs which he observed in death from simple suffocation—namely, dotted ecchymosis on the surface, immediately below the investing membrane (the pleura). Throughout the substance of the lungs, effusions of blood varying in size were generally found, provided an early inspection of the body was made. When some days had elapsed, the lungs were found pale or congested, without any ecchymosed or mottled appearance. The ruptured air-cells with air beneath them were still visible on the surface.

The heart presents no uniform condition; it is sometimes quite empty, and at others it contains dark fluid blood. The brain is occasionally congested, but more commonly in its natural state. In one instance blood was found effused on the brain, but this is an unusual appearance. In suspected homicidal strangulation it is always proper to examine the contents of the stomach for narcotic poison. The condition of the lungs as regards congestion is somewhat remarkable, but probably depends very much upon the time after death at which the autopsy is performed, *vide* pp. 259, 289, and 650.

Special Dissection of the Neck.—In the act of strangulation a much greater degree of violence is commonly employed than is necessary to cause death; and hence the marks produced on the skin of the neck will be, generally speaking, much more evident than in hanging, where the mere weight of the body is the medium by which the windpipe is compressed.

If much force has been used in producing the constriction, the windpipe, with the muscles and vessels in the fore part of the neck, may be found cut or lacerated, and even the vertebræ of the neck may be fractured.

The mark on the neck when a ligature has been used, is commonly described as a depression, wide but not deep, and corresponding in its characters to the form and thickness of the ligature and the mode in which it has been secured. Too much importance must not be attached to this supposed correspondence when the ligature is not forthcoming. In fig. 32, p. 731, the mark round the neck presented the appearance which might be expected from the use of a narrow cord. In this case, however, a soft silk handkerchief was the means of constriction; and a peculiar narrowness of the mark on one side, as seen in the engraving, was owing to the great tightness with which it had been drawn. The mark or impression produced by a ligature is generally circular, from the mode in which the pressure is produced. It may be situated at any part of the neck, but it is more commonly on the windpipe below the larynx, broadly contrasting with the position above the larynx in hanging. In manual strangulation the marks of bruising and ecchymosis will be in the front of the neck, chiefly about the larynx and below it. The circular direction of a mark produced by the ligature is not an absolute indication that strangulation has taken place

without suspension of the body, since instances have been related where a circular mark has been observed in hanging (*supra*); and it is possible that some degree of obliquity may occasionally exist in the course of the depression produced by a ligature in strangulation. A medical jurist ought, therefore, to weigh all the facts connected with the position of the body, and the nature and direction of the ligature, before he forms an opinion, from the appearances presented by the mark on the neck, whether the person has been hanged or not. Greater importance is to be attached to the lividity, ecchymosis, and abrasion of the skin in the course of the ligature than to the circularity or obliquity of the depression produced by it. In the strangling of a living person by a cord, it is scarcely possible that a murderer can avoid producing on the neck marks of severe injury, and in the existence of these we have evidence of the violent manner in which death has taken place.

On the other hand, a person may be strangled, and yet the ligature, in consequence of its being soft and of a yielding nature, will not cause a perceptible depression or ecchymosis—scarcely anything more than a slight depression of the skin. If we except cases of suicide, such a condition must be rare; because assailants usually produce a much more violent constriction of the neck than is necessary to ensure the death of a person. Among the occasional appearances of violent strangulation may be mentioned injury to the windpipe and the muscles of the neck around it. One case, in which the rings of the windpipe were split as a result of pressure, was met with by Inman. Several instances of laceration and rupture of the windpipe are quoted by Chevers (*op. cit.*, pp. 381, 384). In one instance the ossified thyroid cartilage had been broken and forced inwards, causing suffocation. In *Reg.* v. *O'Brien* (Liverpool Wint. Ass., 1857), a case of alleged murder by strangulation, the cartilage of the windpipe was broken; and in the case of Pinckard the windpipe was broken longitudinally. In reference to fractures of the larynx, see Casper, "Klin. Novellen," 1863, p. 497.

The **medico-legal questions** relative to strangulation are of the same nature as those which have been already considered in treating of hanging. Thus, in examining the body of a person suspected to have been strangled, we may be required to answer the following questions:—

1. Was death due to strangulation, or was the ligature placed round the neck after death?
2. Was it accident, suicide, or homicide?

WAS DEATH DUE TO STRANGULATION?

As an abstract question, this really amounts to what evidence is there of asphyxia as the cause of death? but in its forensic aspect it must be held to include what evidence is there of violent compression of the neck or air-passage? and is there any evidence of another cause of death? The actual proofs of asphyxia may be very little owing to (*a*) the great diversity already mentioned in the internal appearances in death from asphyxia (*supra*, p. 649), and (*b*) decomposition effects producing an appearance suggestive of asphyxia, Sect. V. That there is no other obvious cause of death should be comparatively easy of

proof (*a*) by ordinary post-mortem appearances; (*b*) by having some organs analysed for poison. Lastly, evidence of violence to the neck is easy to show, if it exists and carries with it strong presumption of death by strangulation in the absence of any other cause.

The **appearances of an asphyxial death** found in strangled bodies have been above noted, viz., emphysema and hæmorrhages into the substance of the lung, punctated petechiæ in the skin, prominence of the eyes, and protrusion of the tongue, or its pressure against the teeth with a bloody froth and mucus in the trachea. Now, considering that circulation ceases with life, it is utterly impossible to imagine that a ligature placed locally round the neck after death could by any means whatever produce these appearances which are directly the result of circulatory disturbances. Hence the presence of these signs in an undecomposed body is very strongly suggestive of a positive answer—death was due to asphyxia—but it must be emphatically stated that their absence is of no value as proving a negative reply.

What evidence is there of **violent compression of the neck** during life? The ecchymosis about the depression on the neck, when a ligature has been employed, with the accompanying swelling and lividity of the face, are phenomena not likely to be simulated in a dead body by the application of any degree of violence. When the constriction is produced within a few minutes after death, an ecchymosed depression may result; but it is improbable that there should be any lividity or swelling of the countenance. The experiments of Casper, referred to in the Section on "Hanging" (p. 704), bear directly upon this question. He determined, from his observations, that when the constricting force was not applied to the neck until *six hours* after death, the mark indicative of vital strangulation could not be produced. The following is a summary of his experiments on strangulation in the dead body:—

1. *Six hours* after death a double cord was tightly drawn around the neck of a female, below the larynx. On the following morning the cord was loosoned, and the neck examined: there was no particular appearance. When the skin had assumed its natural position, the part where the cord had been placed was scarcely distinguishable.—2. A man died of apoplexy, and *thirteen hours* after death a cord was drawn as tightly as possible around the neck, above the larynx. Six hours afterwards, on examining the neck, a soft impression, easily removed by pressure, was perceptible. There was no discoloration nor any other change to be discovered in the skin.—3. *Twenty-four hours* after death a double cord was very tightly drawn around the neck of a male subject. On examination the next day, there was a slight double depression, but no colour nor any other perceptible change. This experiment was repeated on another subject, with similar results.—4. The last experiment was on the body of a child, about one year and a half old. On the day after death a small cord was tightly drawn and secured around the neck. Twenty-four hours afterwards, a slight bluish mark was perceived: it was quito superficial, but sufficiently distinct to strike tho eye. On cutting into tho skin there was not any blood effused beneath. We learn from theso experiments, that when the attempt to simulate strangulation in a dead body is not made until *six hours* at least after death, thero is no risk of confounding tho mark thus produced with that which is formed when the violence is applied to a living person. It is probablo that, so far as *ecchymosis* is concorned, if the attempt woro madc after an hour or two hours had elapsed, nono would be producod; and with regard to the *non-ecchymosed* mark, it is doubtful whether it could be produced after three or four hours. These periods, it must bo remembered, cannot be determined with positivo certainty; tho results would probably vary, according to the rapidity with which the body had coolod.

It is difficult to conceive under what circumstances an attempt to simulate strangulation in a recently dead body could be made, unless for the purpose of throwing suspicion upon an innocent person connected with the deceased. When an individual has been murdered, it is not likely that the murderer would attempt to produce the appearances of strangulation on a body after death, under the idea of concealing his crime; for strangulation is in most cases an actual result of homicide, and is rarely seen as an act of suicide. In the absence of ecchymosis from the neck, it will be difficult to form an opinion, unless from circumstantial evidence. (See case, "Ann. d'Hyg.," 1848, 1, 444.) It must be remembered, however, that there may not always be an ecchymosed *circle;* for a person may be strangled by the application of pressure to the windpipe through the medium of the finger-nails, or of any hard or resisting substance. The ecchymosis in such a case will be in detached *spots* or *patches*. In the absence of all marks of violence round the neck, we should be cautious in giving an opinion which may affect the life of an accused party; for it is not probable that homicidal strangulation could be accomplished without the production of some appearances of violence on the skin over the larynx or windpipe. It is doubtful whether strangulation can ever take place without some mark being found on the neck indicative of the means used. The bare possibility of death being caused in this manner, without leaving any appreciable trace of violence, must be admitted; although the admission scarcely applies to those cases which require medico-legal investigation. Suicides and murderers generally employ much more violence than is necessary for the purpose of destruction. But if a soft and elastic band were applied to the neck with a gradually regulated force, it is possible that a person might die strangled without any external sign being discovered to indicate the manner of his death. Thugs, and other Indian robbers, were thus accustomed to destroy their victims with the dexterity of practised murderers. A case involving this question of strangulation without marks of violence on the neck was tried in France, and from the medical evidence decided in the affirmative (*Gaz. Méd.*, 1846, p. 375). The medical witness should, however, be prepared to consider whether, in the absence of any mark, death might not have proceeded from another cause. There is nothing to justify a witness in stating that death has proceeded from strangulation, if there should be no appearance of lividity, ecchymosis, or other violence about the neck or face of the deceased. Congestion in the organs of generation is an appearance which it would not be safe to take as evidence of death from strangulation. The state of the countenance alone will scarcely warrant the expression of an opinion, for there are many kinds of death in which the features may become livid and distorted from causes totally unconnected with the application of external violence to the throat, unless accompanied by other well-marked signs of this mode of death. So again, the eyes and tongue may be protruded as a result of putrefactive changes. When there is obvious mechanical violence to the neck, such as fracture of the larynx or windpipe, with laceration of the muscles beneath, and a visible depression, such as a cord, a ligature, or manual pressure

would produce, a medical opinion may be fairly given in spite of putrefaction. But when, in a putrefied body, indistinct marks on the neck or patches of discoloration are relied upon as evidence of homicide, there is a great risk of a serious mistake. See on this question the cases of Ellen Byrne (p. 336) and of *Reg.* v. *Mahaig* (p. 339).

In cases of alleged drowning, it is sometimes the practice to ask a medical witness how far his opinion of the cause of death has been influenced by the discovery of the dead body in or near the water. In cases of alleged strangulation a similar question may be put in reference to the discovery of a rope or ligature round the neck of the deceased, or in the apartment in which the dead body is found. A medical opinion should rest upon the clear and obvious effects produced on the neck and structures below the skin, and not upon the mere presence of a cord or ligature. This might be put round the neck of a dead body or near it for a malicious purpose. The act of strangulation should be, medically speaking, as distinctly provable without the production of a rope as the act of stabbing without the production of the knife which inflicted the stab.

The ligature or cord should always be examined for blood, hair, or other suspicious substances.

In examining the marks of violence on the neck it is very important to notice how much effusion of blood there is round a laceration of the tissues, for we can only judge of circulation at the time of infliction by this amount compared with the size of the actual vessel lacerated.

WAS IT ACCIDENT, SUICIDE OR HOMICIDE?

Accidental Strangulation.—As a general rule, cases of accidental strangulation present no difficulty to a medical jurist, provided the relations of the body to surrounding objects and the compressing force have not been disturbed. Should the body have been removed from the place in which it was first discovered, or the ligature have been removed, we can only establish a presumption of accident from the description given. Accidental strangulation, like accidental hanging, may be looked upon as rare. When the body is not suspended, it is commonly more in the power of a person to assist himself, and escape from the constriction: hence accidental strangulation is less frequent than accidental hanging. A few instances of accidental strangulation are on record.

One was reported by Gordon Smith. The subject was a boy, who was accustomed to move about with a heavy weight suspended by a string round his neck. One day he was found dead in a chair: the weight appeared to have slipped, and to have drawn the cord tightly round the forepart of his neck. In 1839, a girl was accidentally strangled in the following manner: she was employed in carrying fish in a basket on her back, supported by a leathern strap passing round the front of her neck, above her shoulders. She was found dead, sitting on a stone wall; the basket had slipped off, probably while she was resting, and had thus raised the strap, which had firmly compressed the windpipe. A similar case is recorded by Watson ("On Homicide"). A boy, æt. 14, while working in a factory, was caught by a silk necktie in the band of an engine, and his neck was by this drawn down against one of the revolving shafts. The silk handkerchief being knotted and tightly twisted round his neck, his throat was firmly compressed for about one minute. The tie was then cut. As a result of the strangulation, he became black in the face, and blood escaped from his mouth and ears. He was insensible for six

or seven minutes after the ligature had been removed. He then revived and was able to speak, but could not hold up his head. He was sensible when brought to the hospital soon afterwards: his face was pale, his lips livid, his eyes suffused, and the conjunctivæ injected. He breathed without difficulty, and complained of pain only when he moved his head. There was a deep circular depression round his neck over the windpipe, and the skin was much lacerated and bruised. The mark *a b*, in the engraving, fig. 32, was about three-quarters of an inch in width on the side represented. The circumference of the neck was twelve inches, while the inner circumference of the handkerchief which compressed the neck was only eight inches. From this difference it will be perceived that the neck sustained a very strong compression, which accounts for the flow of blood from the mouth and ears. The boy at the time of the accident felt no pain: he had a sense of choking, and then became insensible. For at least *one minute* no air reached the lungs. He recovered, and left the hospital in about eighteen days.

Fig. 32.



Case of accidental strangulation.

The facts of this case confirm the observations of Casper and others on the rapidity with which insensibility comes on from compression of the windpipe.

When a charge of murder is instituted against a person, an attempt is not infrequently made to show the probability that the deceased might have fallen while in a state of intoxication, and have become accidentally strangled, either by a tight cravat or by some foreign substance exerting pressure on the windpipe, nor must it be forgotten that such a person may make frantic efforts to free his neck, and so inflict injuries on his throat that may lead to a suspicion of throttling. If we admit the possibility of an occurrence of this nature, we must not lose sight of the existence of other more probable modes of death, nor should we allow our judgment to be so swayed as to abandon what is probable for that which is merely possible.

Attention must here be drawn to the fact that the umbilical cord may be so twisted round a new born baby's neck as to cause accidental strangulation. If such a case aroused suspicion of homicide, marks of violence would be the chief evidence, as accidental strangulation by this means leaves no bruises or other marks except possibly a slightly indented non-excoriated mark.

The following is a curious case of accidental strangulation. The inquest took place on April 12th, 1904.

At the Stepney Coroner's Court an inquiry was held with reference to the death of Annie Wood, aged thirty-one, the wife of a dock labourer, of Ely Terrace, Mile End. The husband said that the deceased was subject to epileptic fits, and when he returned home on Friday last he found her dead on the floor, with her head wedged in between the seat and the rail of a chair. Dr. Oldfield deposed that death was due to strangulation from falling in the position described whilst in a fit, and the jury returned a verdict of accidental death.

WAS IT SUICIDE OR HOMICIDE?

There is as a rule less difficulty in answering this question in cases of strangulation than in alleged hanging, owing to the greater difficulty

of a homicide being able to simulate a suicide. For all that it may now and again be very difficult to decide, and we must consider the various points that may help us as in Hanging.

1. Statistics.
2. Inherent possibility of suicide.
3. Bodily infirmity as an obstacle.
4. Is there any other cause of death?
5. Marks of violence elsewhere than on the neck.
6. Signs of a struggle.
7. Marks on the neck.
8. Nature of the ligature, and its method of application.
9. Position of body.
10. Circumstantial evidence.
11. Cases of homicidal strangulation.
12. Alleged strangulation.

1. **Statistics.**—In the Reg. Gen. Rep. for 1901, twenty-one males and five females, or a total of twenty-six, are said to have met their death from accidental strangulation. There are no reported suicides by this means, while six males and four females, or a total of ten, are reported to have been murdered by this means; of the ten no less than nine were under one year of age, showing that it is almost entirely confined to children.

2. **Inherent possibility of Suicide.**—This mode of suicide must be regarded as of rare occurrence, and, except under particular circumstances, impossible. The possibility of an individual strangling himself was for a long time denied by medical jurists; for it was presumed that when the force was applied by the hand, all power would be lost as soon as the compression of the windpipe commenced. This reasoning is, however, only applicable to those cases in which the windpipe is voluntarily compressed by the fingers. When a person, determined on suicide, allows the windpipe to be compressed, by leaning with the whole weight of his body on a cord passed round his neck and attached to a fixed point, he may perish in this manner almost as readily as if he had hanged himself; for insensibility and death will soon supervene.

3. **Bodily Infirmity as an Obstacle to Suicide.**—There may be disease, such as paralysis or deformity in one or both of the arms, which may render it impossible for a person to tie a ligature around his own neck. The only caution here to be guarded against is that we do not push this doctrine of incapability too far. When there is a fixed resolution, many apparent impossibilities may be overcome by a person bent on suicide. The following case is instructive:

A middle-aged woman was brought into the Hôtel-Dieu, labouring under such a degree of mental excitement as almost to amount to insanity. Soon after her admission she destroyed herself by strangulation. The nurse, in going round the ward, saw her lying at the side of the bed with her head hanging out. Upon examination it was found that she was dead, and that there was a silk handkerchief around her neck. The handkerchief had been carried twice round the neck and then tied in front. The eyes and eyelids were strongly reddened and swollen. The marks of the ligature around the neck were deep, ecchymosed and partially excoriated: the brain, though a little congested, was healthy. The other organs presented no appearance calling for notice ("Ann. d'Hyg.," 1833, 2, 153).

It is worthy of remark that in this instance, in which there could be no doubt of suicidal strangulation, the deceased had lost four fingers of her right hand, so that this member had been from an early period of but little service to her; nevertheless she contrived to tie the cravat round her neck with great firmness and dexterity. It is easy to conceive that, had her body been found in a suspicious locality, a plausible opinion of homicidal strangulation might have been formed from the maimed condition of the hand. This case, then, will serve to convey a proper caution in drawing inferences as to acts which persons labouring under any corporeal infirmity are capable of performing when they make attempts on their own lives.

4. **Is there any other Cause of Death?**—All marks of violence on the body of a supposed strangled person should be accurately noted, as the questions respecting them, however slight, are material. The witness will be expected to state whether they were inflicted before or after death: if before, whether they were sufficient to account for death, or whether they were such as to be explicable on the supposition of an accidental, suicidal, or homicidal origin. It should be observed whether there exist any morbid changes, sufficient to account for death, in either of the three great cavities of the body, as this kind of evidence may be essential in the progress of the case. In reference to females, whether children or adults, the surgeon should not neglect to examine the sexual organs, so as to ascertain whether there are any marks of violation. Cases have occurred in which rape has been perpetrated, and strangulation resorted to for the purpose of concealing that crime.

A case was tried (Northampton Lent Ass., 1853, *Reg.* v. *Gibbins*), which presents some features of interest in this connection. The prisoner was charged with the murder of her illegitimate son, æt. 8.

He was alive and well at about 4.30 p.m., at which time he was taking tea with the prisoner and her sister; and a little before 8 p.m. he was found dead in bed, lying on his back, with his arms across the lower part of his chest. A silk handkerchief was tied tightly round his neck, and the bed-clothes were a little turned off him. There was a mark or depression round the neck where the handkerchief had been tied, but no ecchymosis beneath. The brain and its membranes were much, the lungs but slightly, congested; the stomach contained some partly digested food; the mucous membrane is stated to have been found considerably inflamed, and the inflammation extended to the upper part of the small intestines.

One medical witness said that, taking into consideration the fact of the handkerchief being found round the neck, and the position of the body, he was of opinion that death was caused by violence (strangulation); and he did not think that the boy could have strangled himself. If he had tied the handkerchief tightly enough to produce strangulation, he could not have returned his hands to the position in which they were found. Another medical witness considered that deceased had died from poison. He formed this conclusion from the extensive inflammation of the stomach and intestines, and from the absence of any other cause sufficient to account for death. He did not think the congestion of the brain was sufficient to cause this, nor did he think that the deceased had died from strangulation. There was an absence of the usual mark, and the face was pallid; the congestion of the lungs was slight, and there was no blood in the right

cavities of the heart. A chemist stated that he had examined the contents of the stomach, but there was no mineral poison; the inflammation of the stomach might have arisen from poison or from natural causes. As the medical evidence failed to prove that the deceased had died from violence, the prisoner was acquitted. It is not at all probable that in this case the appearances in the stomach were the result of inflammation from irritant poison. Any irritant, mineral or vegetable, which would have destroyed life in three and a half hours, without causing vomiting and purging, would have been found in the stomach. The partly digested meal taken at 4.30 p.m., when the boy was seen healthy and well, was there found unmixed with any poison. How, and when, was the silk handkerchief tied round the neck? It was not the result of accident, nor could this kind of suicide be suspected in so young a child. The attitude in which the body was found and the age of the child, were adverse to the supposition of suicide. The handkerchief was not tied round the neck after death—there could be no motive for such an act; it must have been tied while the child was living. The absence of any ecchymosis in the course of the ligature is not opposed to this view. The state of the brain appears to show death from apoplexy as a result of an interruption to the cerebral circulation by the ligature. The usual appearances of asphyxia were wanting in the heart. The redness of the stomach was probably owing to congestion, and not to inflammation, and may have been due to the process of digestion going on at the time of death; or it may have been the result of congestion, as observed in the bodies of executed criminals, in cases of strangulation. There can be little doubt, considering all the circumstances, that this was a case of homicidal strangulation, the fatal effects being produced chiefly through the brain.

5. **Marks of Violence Elsewhere than on the Neck.**—It may be inquired whether *marks* of violence on the body, or blood-stains on the clothes, the furniture, or in the apartment, do not afford strong evidence of *homicidal* strangulation. The answer is—if the marks of violence are such that they could not have arisen from any accident before death, or that they could not have been self-inflicted, they afford the strongest evidence of murder. But the cases wherein so positive an answer can be returned are exceptions to the rule. It is not always in our power to distinguish *accidental* or *self-inflicted* from homicidal violence; and we are always bound to look to the probability of accident, or of previous attempts at suicide being the source of those personal injuries which may be evident on a strangled body.

The throat may be cut, there may be a deep-seated stab or gun-shot wound, involving some of the important organs of the body, or poison may be found in the stomach; but in a purely medical point of view, how are we to know that the deceased did not actually make the marks, inflict the wounds, or take the poison before he succeeded in strangling himself? In the sections on "Drowning" and "Hanging," we have seen what suicides can do when they are bent on destroying themselves. Wounds and personal injuries often create serious difficulties to a medical jurist, which it requires the greatest caution and prudence on his part to meet and explain. Before a charge of murder

by strangulation is raised against any person from marks or appearances found on a dead body, care should be taken that they admit of no other probable explanation than the direct application of violence. Even if marks indicative of strangulation are discovered, the question arises whether they may not have been produced by the deceased upon himself in an attempt at suicide which may have failed. If the body of a person is allowed to cool with a handkerchief, band, or tightly fitting collar round the neck, a mark resembling that of strangulation may be produced. (See the cases of Byrne and Mahaig, pp. 337 *et seq.*)

In this connection the tricks of insane people are often very deceptive, and it will mainly be by collateral evidence that a decision will be arrived at, though it is of course easy to imagine cases in which a decision is easy, for instance, both carotids cut *and* the larynx broken indicate homicide certainly.

6. **Signs of a Struggle, etc.**—In directing attention to the circumstantial evidence, it was suggested that the dress of the deceased might be torn or discomposed, a fact indicative of a violent struggle, and, *cæteris paribus*, incompatible with suicide; but it is proper to remark that evidence of murder, as in Pinckard's case, may be obtained by finding a smooth and undisturbed state of the dress, as well as attitude of the body. In fact, whoever attempts to imitate suicide under such a form of murder must fail in his object. The assassin either does too little, or he does too much. The woman who committed the murder in Pinckard's case had been a nurse in an infirmary, and accustomed to lay out dead bodies. After the murder she appears to have carried out, unthinkingly, her professional experience, by smoothing the clothes under the body, placing the legs at full length, the arms out straight by the side, and the hands open and laid out. Such a condition of the body was quite inexplicable on the supposition of suicide, considering the amount of violence which must have attended the act of strangulation. In the case of Drory, the criminal had attempted to make the death appear like an act of suicide by placing the lower end of the rope near the hand of the deceased: but he selected the *left* hand when the deceased was right-handed, and he did not leave enough rope free from the neck for either hand to grasp in order to produce the violent constriction of the neck caused by the two inner coils. Both of these criminals confessed their crimes before execution. Other reports of cases of alleged death from homicidal strangulation will be found in the *Med. Gaz.*, vol. 41, p. 295, and vol. 44, p. 1084.

Although the cases related under that heading show that suicidal strangulation may be effected under unexpected circumstances, yet in a case of murder by strangulation, it would not be easy to simulate suicide: it would at any rate require great skill and premeditated contrivance on the part of a murderer so to dispose the body of his victim, or to place it in such a relation to surrounding objects, as to render a suspicion of suicide even probable.

In reference to the question of a struggle it must also be remembered that homicidal strangulation may be perpetrated on the weak and infirm without causing any noise or creating alarm. In the first place, if the throat is at once seized and firmly compressed, no cry can be made, nor any noise produced to excite the attention of those who are

near. An aged woman was strangled in her shop by an apprentice in so short a time, and with such facility, that her husband, who was only separated from her by a slight partition, heard no noise or disturbance during the act ("Ann. d'Hyg.," 1859, 1, 157).

7. **Marks on the Neck of the Ligature or other Violence.**—*Finger Nails.*—Supposing the marks of fingers or finger-nails to exist, the presumption is in favour of homicide, as also in all cases where the actual cause of strangulation is not at once apparent on the discovery of the body. Suicides are not likely to strangle themselves in any other manner than by a ligature applied circularly. In cases in which strangulation has resulted from a compression of the windpipe by the fingers (throttling), and where there are fixed ecchymosed marks indicative of direct manual violence, we have the strongest presumptive evidence of murder; for neither accident nor suicide could be urged as affording a satisfactory explanation of their presence. For an instructive case of throttling of a new-born child, where the marks of a left hand were clearly recognisable on the neck, see "Ann. d'Hyg.," 1882, 7, p. 559.

Again, a man, in strangling himself, is not likely to vary the means. The act is commonly due to a sudden impulse. The article which is nearest to the suicide is seized, and made the instrument of self-destruction. It has already been stated as doubtful whether a person could strangle himself by the mere application of the fingers to the windpipe: the discovery of such *marks only* as would indicate this kind of strangulation, therefore, renders suicide in the highest degree improbable. But these marks may be sometimes ascribed to the deceased having fallen with his hand possibly applied to his neck, and the inference will be drawn that they have accidentally resulted from the pressure of his own fingers. This is an improbable mode of accounting for the production of ecchymosis or excoriation of the skin in the front of the neck. If, besides these marks of fingers, we find a circular mark, with a ligature still around the neck, the presumption of murder becomes very strong. It may be said that a person might at first try to strangle himself with his fingers, and not succeeding, might afterwards employ a cord. But the degree to which the coincidental impressions exist will assuredly in general remove this objection. A murder was committed many years since in this country in the manner here stated. A man was found strangled on board of a ship in the port of Bristol. Besides the mark of a rope drawn tightly round the neck, there were distinct impressions of nails and fingers in front of the throat. An investigation took place, and the result proved—as, indeed, this state of the neck rendered it almost certain—that the deceased had been murdered. One of the murderers afterwards confessed that they had first strangled him with their hands, and then drew the rope about his neck, to ensure the certainty of his death.

Finger nail marks might be self-inflicted in a struggle which again suggests homicide, though it must be remembered that an epileptic or indeed anyone might thus injure the throat in an attempt to escape accidental strangulation from a collar.

Fracture of Larynx and Deep Ecchymoses.—In homicidal strangulation, from the unnecessary violence used, we may expect to find the skin much ecchymosed, lacerated, or excoriated, and the deep-seated

parts, such as the muscles and vessels, as well as the windpipe itself, more or less bruised, lacerated, or extensively injured. Such a degree of violence is not commonly to be expected in *suicidal* strangulation.

In the following case the marks of injury to the neck clearly establish homicidal strangulation :—

The dead body of an old man, æt. 70, was found lying in a potato-field adjoining his house. His family consisted of a son, the son's wife, and a male servant—brother to the son's wife. The deceased had gone to gather potatoes for the servant, who was digging. On its being known to their neighbours that the body had been found in the field, suspicions were excited that his death had resulted from violence. On opening the skull a large quantity of dark fluid blood escaped, the membranes of the brain were greatly congested, and sinuses or large veins were gorged with blood, and the brain itself was also congested. Several clots of blood were observed in the lateral ventricles, and some over the surface of the brain. The lungs were filled with dark fluid blood, the air-cells were ruptured, and there was considerable emphysema. The right side of the heart was distended with dark blood. There was nothing remarkable in the abdominal viscera, but the lining membrane of the stomach, which was about half filled with potatoes, was congested. On the neck, over the left side of the thyroid cartilage, there was a slight mark of a crescentic form, with a corresponding though slighter mark on the opposite side. There was a large quantity of coagulated blood immediately beneath the marks, and in the substance of the muscles. On removing this, the left side of the cartilage, which was ossified, was found much depressed, and traversed by a fracture nearly an inch in length.

From the general appearances presented by the body, together with the injury to the thyroid cartilage, an opinion was given that death had arisen from manual strangulation—and, from the particular form of the external marks over the neck, *by a left hand*. Several witnesses were examined, who proved that the deceased and the servant were on bad terms, the deceased having threatened to dismiss the servant, and that before they had gone to dig potatoes, the servant said he would be revenged of his master. The servant was committed for trial. One of the magistrates present desired that the prisoner might be requested to throw a stone, in order to ascertain if he was left-handed, which he did with the *left hand*. At the trial the sister of the prisoner swore that she saw her brother strangling the old man, and several witnesses proved that he had maltreated the deceased on many previous occasions. The jury, having some doubt as to the sister's veracity, acquitted him. For the account of another case, in which fracture of the larynx was properly regarded as a strong fact in favour of homicidal strangulation, see *Edin. Med. Jour.*, December, 1855, p. 527.

There may be *several marks* on the neck, but then the person may have tried to strangle himself more than once.

In 1892, a medical practitioner, Mr. Kerwain, was throttled in the Borough, Southwark, by three men, one of whom placed his left hand over the mouth of his victim, and with the right compressed the throat (*Reg.* v. *Waller and others*, C. C. C., November, 1892). When found within five minutes of the attack Kerwain was just alive, but died almost immediately after. The post-mortem examination, made in the presence of the editor by Carling, showed only a slight mark on the neck, crescentic in form, with the concavity upwards, a little to the right of the median line, and just below the cricoid cartilage. It appeared as if made by a thumb or finger nail. There were no other indications of violence. The scalp showed numerous minute ecchymoses, and the features were of a peculiar leaden, livid hue. There was much blood extravasated along the larynx and trachea. The hyoid bone was fractured on the right, close behind the lesser cornu. The thyroid cartilage was fractured vertically from the notch backwards and downwards to the lower border,

the right cornu was knocked off, and there was an almost corresponding fracture on the left. The cricoid cartilage was also broken on the right, the two ends overriding one another. The lungs were emphysematous and showed a silvery appearance on the surface. The air-cells contained blood, and there was an apoplectic nodule in the left lung. The heart had both its ventricles nearly empty of blood, and the auricles showed no unusual distension (Guy's Hosp. Rep., 1892).

Coull Mackenzie has also described a case of homicidal throttling, where the fractures were very similar to those met with in Mr. Kerwain ("Medico-Legal Exper. in Calcutta," p. 41).

In another case (*Reg.* v. *Pinckard*, Northampton Lent Assizes, 1852), it was proved that deceased was found in a sitting posture in a corner of her room on the floor, with a narrow tape round her neck, hung loosely and singly over a small brass hook about three feet above her head. Her clothes were placed smoothly under her, and her hands were open and stretched out by her side. The engraving, fig. 33, taken from a plan of the room, soon after the murder, will give an idea of the position of the body. There was a severe bruise over the right eye, and there were marks of blood on the tape, as well as on the floor and wall of the room at a distance from the body. There was a stain of fresh blood on the knot of the tape where it passed over the hook, and there was no blood on the hands of the deceased. The windpipe for about an inch and a half was lacerated longitudinally in its rings, and there was a deep circular mark round the neck in the course of the doubled tape, as if either from great pressure applied by some person, or from the weight of the suspended body.

Fig. 33.



The latter hypothesis, so far as the tape round the neck was concerned, was untenable. The body of the deceased did not weigh probably less than 120 pounds, while the tape found round her neck broke with a weight of 49 pounds: hence the deceased could not have been freely suspended by it. Apart from this the injuries to the parts about the neck, including the longitudinal fracture of the windpipe, were not such as the tape could have produced as a result of partial suspension in the position in which the deceased's body was found. The noose had been so placed that the greatest pressure was on the back of the neck, and the least in front, where the greatest amount of mechanical injury was actually done. The deceased had been strangled, probably by manual violence in the first instance, and afterwards by the use of a ligature drawn tightly by the hand. The body was then looped up with the double tape. These facts, taken in connection with the smooth arrangement of the clothes, the severe marks of violence on the body (inexplicable on the hypothesis of suicide), and the marks of blood and struggling in the room, proved that there had been homicide; and the crime was brought home to the prisoner by a series of moral and circumstantial proofs inconsistent with her innocence.

False marks on neck.—A caution must be entered here to see that the mark *is* that of a cord.

On the dead bodies of infants and children, in whom the neck is short, a mark is occasionally seen which arises from the bending of the head; and in short-necked persons a similar mark or depression has been noticed after death, in front of the neck. These marks are then rendered more prominent by their assuming a livid appearance. They might, at first, be mistaken for marks produced by a ligature in attempted strangulation. In one case a death from apoplexy was attributed to homicidal strangulation from a cadaveric change of this kind ("Ann. d'Hyg.," 1859, 1, 139; and 26, 149).

Mark in a Burnt Body.—The mark on the neck has furnished evidence of this mode of death, even under circumstances in which it might be supposed all evidence would be destroyed. Schüppel describes a case in which he was able to verify the fact of strangulation after the burning of the body.

Fig. 34.



Mark of strangulation on the burnt neck of a boy, æt. 10, showing the depression produced by the ligature on the back of the neck.

A fire took place in a cottage in which there were at the time a man and his wife with a stepson (æt. 10) and a new-born infant. The man escaped with the infant and said that his wife and stepson had left the house before the fire. This was proved to be a falsehood: their dead bodies were discovered much burnt, and the carbonized remains were collected and buried in one coffin. A suspicion of incendiarism and murder arose, and the bodies were exhumed thirteen days after the burial, and submitted to the examination of Schüppel. The body of the wife was so completely destroyed by fire that no satisfactory medical evidence could be obtained from it. The parts not entirely burnt were much putrefied in both corpses. On examining the burnt remains of the boy, there was a horizontal mark or depression encircling the greater part of the neck, about one-quarter of an inch wide, and presenting a smooth surface quite distinct from the broken, blistered, and carbonized skin above and below it (fig. 31). The width of the mark in the middle of the neck (the nape), where it was most superficial, was about a quarter of an inch: on each side of the neck where the pressure had been greatest it was three-fifths of an inch. The depth of the mark at the sides was one-eighth of an inch. This became less as it approached the nape, where it was reduced to one-fifteenth of an inch. On examining the remains of the burnt head and face, it was found that the skull was fractured and that the tongue protruded remarkably from the mouth. Between the larynx and lower jaw, there was a depression such as might have been caused by a cord or ligature—but the mark was not so clear or distinct as that at the back of the neck. The bones of the body were broken and displaced.

From this condition of the neck and tongue, Schüppel drew the conclusion that the boy had died from strangulation, and that the ligature had been applied to the neck while he was living, and had been burnt with the body. (Horn's *Vierteljahrsschr.*, 1870, 2, 140.) Schüppel found by experiment that when a ligature was drawn tightly and left on a *dead* body submitted to fire, it for a time protected the depressed portion of skin, and although ultimately consumed, it

allowed the part compressed to retain the smoothness observed in this case. When the ligature was applied with all the force required to produce strangulation, but removed before the application of fire, the appearances of the depression or mark were lost when fire was applied, owing to the swelling and blistering of the skin. The man accused of this double crime alleged in defence that a beam might have fallen and produced the mark observed on the neck; but this would not explain the facts. The protrusion of the tongue was a strong proof of the strangulation of a living person. The man was found guilty of the murder of his wife and stepson, and a few days afterwards he committed suicide by hanging himself while in prison. He had set fire to the house after the murder, in order to conceal the double crime.

Garrotting.—It is proper to notice, in this place, the occurrence of what are called **Garrotte robberies.** The rigorous proof required of facts, which under these assaults can rarely admit of direct proof, confers much impunity on the assailants. The attack is made during darkness; the person is seized by the windpipe from behind, or a bandage is thrown round his neck; and this is suddenly tightened, while accomplices are engaged in perpetrating robbery. The nature of the assault, by pressure on the windpipe, renders it impossible to give an alarm or call for assistance. The person assaulted, if he should recover, is seldom able to identify an assailant: he is attacked from behind, is rendered immediately senseless and powerless, and can rarely offer any resistance. Recovery or death in such cases depends on the lapse of a few seconds, more or less, during which the constriction of the neck is continued—on the degree of constriction, and the age, sex, and strength of constitution of the person assaulted. An attempt at strangulation, as in garrotting, besides inflicting serious local injury to the windpipe and other parts near to it, may cause a state of insensibility which may continue for some hours. There is severe pain in the throat, with difficulty of speaking and swallowing, and if the larynx is seriously injured there may be loss of voice. Dumbness, however, is not one of the secondary symptoms; and loss of voice is usually only temporary during the pressure. By the 24th and 25th Vict. c. 100, s. 14, it is enacted, that "whosoever shall attempt to drown, suffocate, or strangle any person, with intent to commit *murder*, shall, whether any bodily injury be effected or not, be guilty of felony; and being convicted thereof shall be liable, at the discretion of the Court, to be kept in penal servitude for life, or for any term not less than three years, . . . or to be imprisoned for any term not exceeding two years." As the intent in these cases is to perpetrate *robbery*, and not murder, another section (21) has been framed, for the prevention of the crime of *garrotting:* "Whosoever shall, by any means whatsoever, attempt to choke, suffocate, or strangle any other person, or shall, by any means calculated to choke, suffocate, or strangle, attempt to render any other person insensible, unconscious, or incapable of resistance, with intent, in any of such cases, to enable himself, or any other person, to commit, or with intent in any of such cases thereby to assist any other person in committing, any indictable offence, shall be guilty of felony; and being convicted thereof shall be liable, at the discretion of the Court, to be kept in penal servitude for life, or for any

term not less than three years, . . . or to be imprisoned for any term not exceeding two years," etc.

8. **Nature of the Ligature and its Method of Application.**—In all cases of fatal strangulation resulting from an act of suicide, the means by which strangulation was produced must be found upon the neck. The condition of the mark on the neck, the course and direction of the cord, the mode in which it was secured or fixed in order to produce effective pressure on the windpipe, the amount of injury to the muscles and parts beneath, are circumstances from which, if observed at the time, a correct medical opinion may generally be formed. If the means of constriction are removed, or the cord or ligature is loosely applied, these facts, unless explained, are presumptive of homicidal interference.

Thus, if the cord or ligature should be found loose or detached—if the ecchymosis or mark in the neck should not accurately correspond to the points of greatest pressure—if, moreover, the means of constriction were not evident when the body was first discovered and before it had been removed from its situation, there would be fair grounds for presuming that the act was homicidal.

If the ligature be still around the neck, the position of the knot may throw some light upon the case; if tied in two or three knots at the back of the neck, the presumption is assuredly in favour of homicide. Then, again, the nature of the ligature should be attended to. Suicides generally employ for ligatures those articles of dress which belong to them and are nearest at hand—such as handkerchiefs, stockings, or garters.

In all cases the cord or ligature, if forthcoming, should be examined in order to determine whether it bears upon it marks of blood, or whether hair or other substances are adhering to it. A portion of it should be reserved for the purposes of identification. In two instances of homicidal strangulation, the ligatures found round the dead bodies were proved to correspond with portions of the same material found in the possession of the persons who were charged with the murders. In removing the ligature from the neck, the mode in which it is secured should be noticed, as this may be a fact of importance in reference to the allegation of suicide. Some instructive cases of this form of asphyxia will be found in the "Ann. d'Hyg.," 1868, 1, 193.

On other occasions, the peculiar disposition or nature of the ligature has enabled a person bent on suicide to strangle himself without much difficulty. An instance is related by Orfila, in which two cravats, that were twisted several times round the neck of the deceased, who was discovered lying on his bed, had effectually served the purpose of self-destruction ("Med. Lég.," vol. 2, p. 389). Sometimes strangulation had been suicidally effected by a rough cord passed repeatedly round the neck, and tightened by being pulled with each hand. The number of coils would still cause some pressure to be exerted even when the grasp was relaxed by death (Guy's Hosp. Rep., 1851). Other cases are related, in which suicides have succeeded in strangling themselves by tightening the ligature with a stick (Guy's Hosp. Rep., 1851); or when the ligature was formed of thick and rough material, by simply tying it in a knot. A young female was found one morning dead in bed, lying on her face, with a woollen garter passed twice round her

neck, and secured in front by two simple knots, strongly tied one on the other. The body was in an incipient state of putrefaction, but still there was a mark corresponding to the ligature. This was shallow, of a slight greenish colour, especially in front, and presented here and there ecchymosed spots; the mark was scarcely visible behind. The face was livid and swollen: a quantity of bloody mucus escaped from the mouth and nostrils. The lips were livid: the tongue was protruded and firmly compressed between the teeth: the body presented over the trunk and limbs patches of ecchymosis. On cutting into the mark on the neck there was no extravasation, neither was there any apparent injury to the deep-seated muscles or adjacent parts; the lungs were gorged with blood, but the other viscera presented no particular appearance. The examiners gave it as their opinion that the deceased had died from apoplexy resulting from strangulation. They stated that the head was not examined, and they judged that apoplexy was the cause of death from the condition of the face. A more important question was whether the strangulation was suicidal or homicidal. There was some reason to suspect the latter, and indeed a person was pointed out as the probable murderer; but a rigorous medical investigation, relative to the state of the body and clothes, as well as numerous collateral circumstances, satisfactorily established that this was really an act of self-destruction.

In 1883 the dead body of a woman, æt. 40, was found in Horsleydown, strangled. Her husband had left her, at 8 a.m., in a nervous, depressed condition. On his return to dinner at midday he discovered her stretched at full length upon the bed with some thin twine twisted round her neck, and fastened to the iron rails at the head of the bedstead. She was black in the face, and lying about two feet down the bed. He at once cut the string from her throat, and ran for a medical man. Fitzrayne, on his arrival, found that the woman had not been long dead. The body was straight. The features were very much distorted. He thought she had struggled, but the bedclothes were smooth, and so were her own clothes. The case was clearly one of suicidal strangulation. The woman had previously been confined in a lunatic asylum.

In *Reg.* v. *Cooper* (Shrewsbury Lent Ass., 1863), the prisoner was convicted of the murder of his son by strangulation. In this case a twisted cotton handkerchief was found round the neck of the deceased, a boy only eight years old. It was tied tightly, and with a double knot; a finger could not be introduced between it and the neck. The face had a bloated appearance; the tongue protruded, and the teeth were deeply indented into it. The surgeon rightly concluded that this was a case of homicidal strangulation.

The carelessness with which these inquiries are sometimes conducted is shown by the fact that in *Reg.* v. *Browning* (C. C. C., Dec., 1845), in which the prisoner was convicted of murder by strangulation, the verdict of the coroner's jury was to the effect that deceased had strangled herself in a fit of temporary insanity. In this case the cord had been twisted tightly twice round the neck and then tied in a knot.

The mode in which the notorious criminal Greenacre attempted to destroy himself by suicidal strangulation presented some novelty. In March, 1837, while he was confined at a station-house, he was found by an inspector who entered the room, lying on the floor with a handkerchief drawn tightly around his neck by means of a loop, into which he had inserted his foot.

When first seen his face was livid and he was apparently dead; the handkerchief was cut, he was bled, and other means of resuscitation were employed with success. The manner in which General Pichegru

was found strangled in prison gave rise to a strong suspicion of murder, merely from the singularity of the method adopted. The ligature which he employed was found tightened around his neck by means of a stick, which had been twisted and then fixed behind one ear; there was no lividity of the face. It was contended that Napoleon I. had caused the General to be strangled or suffocated, and that the ligature was afterwards applied. The evidence of this having been an act of homicide was very weak; and, so far as the medical circumstances extend, there is no reason to doubt that it was an act of suicide. The only obstacle to the admission of this, in the opinion of some jurists, was the employment of a stick for the purpose of tightening the ligature; but there are at least two similar cases on record, in which a suspicion of murder could not be entertained; one of these is referred to by Metzger (*op. cit.*, p. 309), and another in Guy's Hosp. Rep., 1851.

The body of a young woman was found lying upon the face, strangled, with a rope coiled three times round the lower part of her neck: the two inner coils (involving the windpipe) were tight, the outer coil loose, the end of the cord being placed loosely near the left hand of the deceased, which was raised towards it. Tho length of the free portion of cord was not sufficient to allow of the deceased grasping and tightening it to such a degree as to produce the great amount of violeuce found on the neck. The windpipe was flattened and its canal completely obstructed by the pressure of the two inuer coils of rope.

Admitting that a person could draw one coil so tightly, she could not retain the power of drawing a second with equal force, and after this a third. Fleischmann's experiments prove that pressure on the windpipe, sufficient to flatten it, is attended with instantaneous insensibility and loss of power. In Drory's case too much was done; one coil might have left the question of homicide doubtful—three coils, so drawn, were inconsistent with the theory of suicide. The evidence, medical and circumstantial, clearly traced the crime to the prisoner, and he was convicted (*Reg.* v. *Drory*, Essex Lent Ass., 1851, Guy's Hosp. Rep., 1851., p. 371).

No hard and fast rule can be laid down on the subject; it is necessary to judge each case on its own merits.

In the following case there was evidence of design, and also evidence that no other person could have been near at the time, so that suicide was certain.

The circumstances attending the death of Arthur Walsh, aged forty, of no occupation, were inquired into by Mr. Troutbeck, at Battersea Coroner's-court. Dceaseɔ was found lying dead ou the floor of the room ho occupied, dressed only in his undervest. Around his neck was an ordinary picce of string, which he had tightened by passing the handlo of an umbrella through the loop and twisting it round at the back of his head. A verdict of suicide during temporary insanity was recorded.

9. **Position of the Body.**—In the chapter on "Hanging" it was stated that suicides were often found with their bodies in close contact with the ground; and cases were described in which strangulation was accomplished in this manner, while the suicide was in a sitting or kneeling posture.

It is obvious that precisely the same reasoning, though even more strongly expressed, applies to the position of the body in strangulation,

though at the same time the other points, such as the marks on the neck, etc., are to be here considered more strongly than the mere position of the body.

10. **Circumstantial Evidence.**—In contested questions of suicidal or homicidal strangulation, the Court must be greatly indebted to evidence founded on circumstances, as well as to moral presumptions. How far a medical jurist may be allowed to make use of these in the formation of an opinion it will be for the Court to determine. Generally speaking, his duty is rigorously confined to the furnishing of evidence from medical data alone. But there are numerous circumstances of a collateral nature which may materially modify an opinion. Thus the sight of a ligature, the state of the dress, and the attitude of the deceased when discovered, although not strictly medical circumstances, bear directly upon medical opinions. Without circumstantial evidence, the best medical opinion in these cases will often amount to nothing. It is a mistake to suppose that we must in all cases look to medical circumstances *alone* for clearing up intricate questions. On some occasions the theory of homicide or suicide will be equally consistent with the facts. The cases of Dr. Franck and his son, which occurred at Brighton in 1855, were of this ambiguous character. Whether the son strangled himself, or was strangled by his father, was a question which could not be satisfactorily solved by medical, moral, or circumstantial evidence. Unfortunately, the bodies did not undergo a proper medico-legal inspection.

The following case ("Ann. d'Hyg.," 1829, 2, 447) was pronounced to be a case of *suicidal* strangulation by some, and of *homicidal* by others. A servant girl was found dead in her bed. The body was rigid and lying in a constrained position, with the face turned to the right, and there was a handkerchief so firmly tied around the neck that it was with some difficulty removed. A quantity of froth and bloody mucus escaped from the mouth and nostrils. The knot in the handkerchief which was tied round the neck was on the *left side*, as it is customary to find it in left-handed people. The deceased was not left-handed, and there was no reason to suspect that she had intended to commit suicide; she went to bed the night before in her usual health and spirits. There was no mark of violence externally, but there were large patches of cadaveric lividity scattered over the skin. There was a deep impression of a necklace on the skin of the neck, which had resulted, it was supposed, from the force with which the handkerchief had been tied. The neck appeared swollen, especially on the right side. On opening the head, the vessels of the brain were found distended, especially on the right side; and on this side about half an ounce of blood was found extravasated. In the mouth the tongue projected forwards between the teeth, but was uninjured by them. The contents of the chest and abdomen presented nothing unusual; the lungs were gorged with blood. The examiners attributed death to strangulation, and in their judgment the act was not suicidal.

Among the reasons assigned for this opinion, was the fact that the handkerchief was tied on the neck in *two knots*, and the deceased could *not* have made more than one; her senses would have failed her before she could have made a second, or at least before she could have made it so perfectly as the first. The position in which the body was found, the conduct of the deceased before her death, and the absence of all motive, were facts also adverse to self-destruction; but as no criminal could be pointed out, it was suggested that the act was suicidal. The College of Brunswick, being appealed to by the legal authorities, concluded that the deceased could not have died from strangulation, and

assigned an attack of apoplexy as the probable cause of death, from the extravasation of blood met with in the brain. They considered that the girl had *herself* tied the handkerchief round her neck for the purpose of keeping herself warm, as the night on which she died was extremely cold. They admitted the probability that she might have imprudently tied the handkerchief too tightly, a circumstance which had perhaps facilitated the congestion of the cerebral vessels and extravasation of blood. The reason assigned by the College for their opinion was that the handkerchief had produced no ecchymosed mark on the neck; but as it is now well known that a person may be strangled and no ecchymosis be produced, the argument that the deceased had not died by strangulation falls to the ground. The motive alleged for the handkerchief being placed around the neck appeared inconsistent with the facts. It is scarcely to be imagined that any person who did not contemplate suicide would retire to rest with a handkerchief tied in a double knot *so tightly* around the neck as to render it very difficult to remove: it was evidently so tight that strangulation might easily have resulted from the constriction. The apoplectic appearances in the head may have been due to the impeded circulation of the blood, in consequence of the ligature. There was, therefore, nothing to contradict the opinion of death from strangulation: no morbid cause capable of giving rise to sudden death (excepting effusion of blood on the brain, which has already been accounted for) was discovered in the body. Whether the ligature was placed round the neck by the female herself, or by another, may be a matter of doubt: yet when we consider that there was nothing absolutely impossible in the act on her part, that there were no appearances of violence about her person or clothes, and no evidence of any individual having had access to the apartment, it appears most probable that the strangulation was *suicidal.*

It requires but little ingenuity to see that circumstantial evidence may be almost the only support of a theory either of suicide or homicide: time, place, locked doors, fastened windows, motives, etc., etc., may all play their part.

Homicidal Strangulation—Evidence entirely Circumstantial.

Arthur Shaw, a Manchester tailor, was tried at the Liverpool Autumn Assizes in 1884, for the wilful murder of his wife. Owing in great measure to her drinking habits, he had lived unhappily with her for some time. On the evening of November 3rd, 1884, he came home at about 8.30, and finding that his wife had gone with her knitting into a neighbouring house, called there for her. They went into their own house together, leaving their little girl on their neighbour's knee, asleep. They were both sober, though Shaw was wearing his hat on the back of his head, and looked excited and surly. A few minutes later the neighbour's wife took the little girl home, handing her to her mother. As she left the house she saw Shaw's door being fastened. Soon afterwards she went out on an errand, and as she passed Shaw's door she heard moans, whereupon she knocked at the door, shook it, and tried to open it; but as no one answered, she went on about her business, and returned in five or ten minutes. In the meantime Shaw had been to ask for assistance, saying that he and his wife had had a little bother, that his wife had fallen into the fire-place, and that he feared she was dead. Two men had gone back with him into the house, and had there found in the room on the ground floor the prisoner's wife sitting on a chair, with her head leaning back against the wall, apparently dead. The ashpan was in its proper place, and the fender and fire-irons did not appear to have been disturbed. There were marks of blood on the table

and wall, and also on the floor of the room, which was a very small one, being only about three and a half yards square. The prisoner was arrested shortly after nine o'clock the same evening. On being charged with the murder of his wife, he protested his innocence. He afterwards stated that his wife refused to go to bed when he wished her, and that on her attempting to leave the house he interfered to prevent her, and that she then fell into the fire-place, owing to her foot having caught in some old sacking which served as a hearthrug. At the post-mortem examination there was found a bruise, with extravasation, immediately beneath the lobule of the left ear; and another, also accompanied with extravasation, three quarters of an inch below the lobule of the right ear. Corresponding to this latter bruise, a second effusion of blood had taken place into the deeper tissues, half an inch beneath the surface. Other bruises were found over each eyebrow, at the back of the right wrist, over the knuckle of the left little finger, at the inner side of the left elbow, and at each angle of the mouth. Within the mouth at the line of reflection of the lower lip, on the left side, was a contused and lacerated wound opposite the jagged stump of the canine tooth, and exactly opposite to this at the line of reflection of the upper lip on the same side, there was another small bruise, accompanied with extravasation, The tongue was bruised on the right side, as though it had been caught between the teeth. The left lateral incisor tooth in the upper jaw was partially loosened, the torn gum and effused blood showing that the injury was recent. The blood in the body was dark and fluid. The brain and membranes were intensely congested, the blood pouring out in considerable quantities on removing the calvaria. There were no marks of injury to the throat, either externally or internally. The lungs were congested, and exhibited patches of emphysema on their surface. The heart contained a quantity of dark fluid blood. The abdominal viscera were healthy, and not noticeably congested. There had been an escape of urine and fæces. In the opinion of the medical witnesses death was caused by strangulation, the neck having been grasped between the fingers and thumb while the chin was raised. The marks indicated that the pressure had been applied behind the angles of the jaw over the internal jugular veins, which would account for the intensity of the intra-cranial congestion. The defence was that death was caused by apoplexy. The Judge (Justice Day) took a serious view of the case. He told the jury that if they were satisfied that deceased was strangled, he saw nothing which could reduce the crime from murder to manslaughter. The jury showed some hesitation in accepting this view, but ultimately returned a verdict of guilty of wilful murder, at the same time recommending the prisoner to mercy. The prisoner was sentenced to death and executed, in spite of efforts to obtain a reprieve. What weighed strongly with the judge was his refusal to open the door when the neighbour knocked at it, shook it, and tried to open it. The evidence of the police and other witnesses also flatly contradicted his story of his wife having fallen into the fender, in addition to which such fall would not have caused the injuries found (*Medical Chronicle*, vol. 1, pp. 577, 578).

The following cases have been communicated to the Editor by Dr. Lowndes, of Liverpool.

Homicidal Strangulation—Evidence Circumstantial—Signs of a Struggle—Marks on Neck.

A man, following the occupation of a market porter, was tried at the Spring Assizes, Manchester, in 1875, for the murder of a woman with whom he cohabited. Her death had been caused by that form of strangulation known as throttling, and the interest attaching to some of the internal post-mortem appearances induced Cullingworth to place the case on record. The accused man and his companion occupied a room on the ground floor of a house in Ancoats, the other rooms being let off to different tenants. Access to the rooms was by a common outer-door opening into a small lobby or entrance from three to four feet square, of which the left side formed the door of the room where the catastrophe occurred; and at right angles to this, facing the entrance, was the door of another room inhabited by an old man and his wife, who were the principal witnesses, and who must have seen any person enter the adjoining apartment, after the closing of the outer door for the night. Late in the evening of Saturday, December 26th, 1874, the accused and the deceased woman were seen in their own room sitting alone. Both of them were quite drunk.

They then appeared to be on good terms and were drinking beer together. One of the witnesses deposed to having heard them attempting to join in the singing of a convivial song. About one o'clock in the morning the old people on the same floor were startled by a noise as of a table being capsized, followed by a loud crash of breaking pots; some moaning was heard shortly afterwards, and then all was still. At half-past five the accused man tapped at his neighbour's door and asked for a light. A candle was lent to him, with which he went back to his room, and presently returned, having found the woman, by whose side he had been lying asleep, dead and cold. He at once gave information to the police, who arrested him on a charge of murder.

At nine o'clock on the morning of the 27th the room presented the following appearances. A large round table was lying on its side, an arm chair in one corner was also thrown over and three of its legs were broken, the floor was strewn with broken pots of all sorts and sizes, and in the middle of the room lay a mass of solid human excrement. In a washing bowl on a side table, composed of an old box, was a quantity of dirty water, on the surface of which solid excrement was floating. On a low bedstead in one corner the body of a woman lay on her right side, dressed in every-day clothing, and in a condition of rigor mortis. The face, more particularly on the right side, was swollen and livid, and a little blood had oozed from the mouth, nose, and inner angle of the eyes. Immediately over the larynx, and on each side of the middle line, there were livid marks of irregular outline, such as might be caused by the pressure of thumb and fingers. There were also several dark bruise-like discolorations on the flexor surface of both forearms; the hands were clenched and the elbows flexed. There had been a discharge of fæces from the rectum, and on one leg an ulcer was found, for which it turned out that she was being treated as an hospital out-patient at the time of her death.

The post-mortem examination was made on the evening of the same day (Sunday, the 27th) by Cullingworth and Dreschfeld. The thorax was first examined, and on removing the sternum the pericardium was opened before the organs were disturbed, the heart separated by grasping the roots of the great vessels, and carefully cutting through them above the fingers. The valves of the heart were free from disease, and *all the cavities of the heart were empty*. There were no signs of injury to the hyoid bone or cartilages of the larynx, the mucous membrane lining the larynx and trachea was congested and covered with frothy mucus. The lungs were intensely congested in several places, hæmorrhage had taken place, and masses of lung tissue, some of them of considerable size, were found on both sides, chiefly towards the bases solidified from the presence of the effused blood. The abdomen was next examined, the stomach was empty and normal, and no congestion was met with in any of the abdominal viscera. The head was last examined, and revealed a perfectly natural condition of the brain and its membranes. Cullingworth gave it as his opinion that death resulted immediately from congestion of the lungs, caused by a forcible and recent stoppage of the respiration. He considered the marks on the front of the neck were most probably marks of the thumb and fingers, and maintained that pressure continuously exerted at that spot for a period of three to five minutes would cause death and account for the internal appearances. In answer to a question put to him by the judge as to the possibility of a person moaning after fatal pressure of this kind, Cullingworth denied the possibility, and suggested that the moaning probably occurred previously when the bruises were received on the arms. On the whole it seemed likely that the accused, desiring the woman to retire to bed, became irritated at her obstinate refusal, and proceeded to hold her down by the throat, his condition of drunkenness obscuring his estimate of the consequences. The case was reduced, by permission of the Court, to one of manslaughter, the man found guilty, and sentenced to eighteen months imprisonment. The points of interest in this case suggested by Cullingworth were: (1) Absence of signs of cerebral congestion; (2) the number and extent of the hæmorrhages into the lungs; and (3) the emptiness of the heart's cavities on the right side (*Lancet*, May 1st and 29th, or vol. 1, 1875, pp. 608 and 776).

Homicidal Strangulation—Evidence of Wounds—Marks on Neck, but Ligature the Doubtful Point leading to Acquittal.

An inquest was held by the Liverpool coroner on the 2nd May, 1888, on the body of a woman named Halsall, who lived in a small street near a leading thoroughfare. The deceased and a man named Fowler were heard quarrelling one evening,

and the woman was heard by the neighbours to say, "You dare not do it," presumably "You dare not kill me." A scuffle ensued, she screamed, and all was quiet. Some time after, when persons went to the room, Fowler had to remove a table which was against the door to let them in. She was then found to be dead, lying on the sofa quite in a straight and undisturbed position. A police inspector who was called removed a handkerchief which was found round the throat, without taking due note of its position. Dr. Wiglesworth, who resided near the locality, was called, and subsequently made a post-mortem examination, in conjunction with Mr. F. C. Larkin, at that time Demonstrator of Anatomy at the Liverpool University College. The following are the external appearances they found. The body was well nourished. The face was congested, the pupils semi-dilated, the right eyelid ecchymosed, conjunctiva ecchymosed and injected; left eyelid ecchymosed result of violence many days before. Inner surface of upper lip cut just to right of centre about ½ inch long, ⅛ inch deep. Lower lip had internal bruise, and both marks apparently due to same violence; slight swelling of integuments of chin. On the neck there was a mark of circular constriction extending all round, but more plainly visible at back and sides, not much in front (only on careful inspection); the breadth of this mark was from 1 inch to 1⅛ inch, no excoriation. No other external marks of violence. Internally the lungs were congested, generally including the apices and superior surfaces; the right one was healthy, the left showed signs of old pleurisy. In the heart the right side was distended with dark semi-fluid blood, the left side empty, the general condition congested, but not fatty; it appeared healthy; the valves were all healthy. The tongue was ecchymosed at base with effusion corresponding to other marks of violence, demonstrating great force; mucous membrane congested at the back of the tongue; the tonsils were enlarged and congested. The larynx was normal except for the epiglottis, which was congested (dotted ecchymosis), the trachea was congested and empty, the bronchial tubes were congested; lower tubes contained some bloody mucus mixed with hair. The pharynx was slightly ecchymosed at the part corresponding to the constriction, especially behind the cricoid cartilage. The brain was somewhat congested but healthy; the stomach was nearly empty, some small quantity of contents escaping when removed. There was no special smell of alcohol, it was ecchymose at the cardiac end. The blood was fluid throughout the veins. The liver and kidneys were congested; all the other organs were normal. The deceased was menstruating at the time of death. The coroner's jury returned a verdict of wilful murder against Fowler, who was duly committed for trial. At this the medical witnesses expressed a very strong opinion that the strangulation could not have been self-inflicted, but each declined to swear that it was impossible for her to have done it. The handkerchief was an ordinary woman's black silk tie. The jury acquitted the prisoner.

Homicidal Strangulation—Evidence from Marks on Neck and Injury to Trachea.

On the 8th July, 1848, a Liverpool sailor who had been paying his addresses to a female, took her to chapel for the purpose of marrying her, but being too late the ceremony was not performed; he then took her to his lodgings. On his way thither he met a friend who was somewhat intoxicated, he himself being in the same state. At night he went to bed with the woman; his friend sat or lay all night at the foot of the bed. About four o'clock on the morning of the 9th they both came downstairs. One went to the privy, the other to purchase some rum, saying to the mistress of the house that the female upstairs was ill. They both shortly went again upstairs, and some little time afterwards summoned the mistress. She went upstairs, but did not see the woman as her face was covered up. She sent immediately for Mr. Stewart, surgeon, who lived near. He arrived at 8.30 a.m. and found the woman dead. He was told that she had been seized with vomiting and purging, but he saw nothing to indicate one or the other. The mistress stated very indefinitely before the coroner that she had seen something of the kind. Mr. Stewart knew nothing of the previous history of the case, and had no suspicion that there had been foul play. He found her lying upon her back, extremities cold, and body getting cold, rigidity commencing, the arms extended at her sides, face natural, no protrusion of the tongue, in fact, nothing to attract particular notice. He concluded that she had been dead about two hours. Some rumours having got abroad, he and his partner, Mr. Hill, were requested by the coroner to make a post-mortem examination; this was done on the 11th, about fifty-eight hours after death.

There was no discoloration of the neck, but it was swollen particularly on the right side, and when pressed upon, produced the crepitating feel of emphysema; this extended down to the back, shoulders, and chest of the same side. On making an incision in the mesial line, no extravasation of blood was found amongst the soft parts; on pushing the muscles aside with the handle of the scalpel, a small clot of blood the size of a four-penny bit was seen on the right side of the trachea; around this clot was a slight effusion of fluid blood, and the cellular tissue was softer and more easily broken up than elsewhere. On removing the clot an opening into the trachea was found directly under it, and on further examination another opening into the trachea was found, rather more in front. The larynx and trachea were then removed; a considerable amount of frothy fluid was found in the trachea, the lungs were distended with air, but did not protrude when the thorax was opened; they were much congested posteriorly, the right side of the heart was distended with blood, partly fluid, partly coagulated; the left side was also filled with blood, but not distended. Such is a summary of the evidence given by Stewart before the coroner. On the afternoon of the same day (11th July) the trachea was taken to Long, a Liverpool surgeon of great experience, and for many years lecturer on anatomy at the Liverpool Medical School. He examined the body, which had been opened in the morning; the weather was excessively hot, decomposition rapidly advancing. The head was opened, but nothing worthy of remark was found. The stomach contained about a tablespoonful of a sanguineous fluid having no particular odour. There was nothing else to be noticed except the trachea, which was examined the next day (12th); after being all night in spirit and water Long found the second ring on the right side broken with absence of a small portion of the ring, thus leaving an opening about four lines long and three wide. The third and fourth rings were broken through perpendicularly near their centres; three or four rings below these were cracked, but not broken through; the fractured ends presented a clean, not a jagged, surface, the mucous membrane had, however, a jagged appearance, as if torn; it was of a dark port-wine colour, being deepest at the injured parts, and fading gradually in colour as it was more distant from them. The trachea at the injured part resisted pressure when made directly in front, but when the pressure was made obliquely at both sides at once by the finger and thumb it gave way, and the parts overlapped each other, producing the impression that the injury had been inflicted by pressure in the direction above indicated. I discovered two slight cuts made by the scalpel in cleaning the larynx on the fore-part of the cricoid cartilage, and a small piece sliced off it on the left side close to the thyroid cartilage. Stewart, on clearing the soft parts adhering to them, found a small bit of cartilage corresponding to the aperture in the second ring above mentioned.

Long, who was a strong, powerfully-built man, then not quite forty years of age, tried on the body of a female of about the same age (twenty-six) recently dead, to break the trachea by making pressure with his thumbs obliquely at the sides of the neck and on the trachea, having the fingers behind the neck. He used all the force he could exert, getting an assistant in addition to place his thumbs on his to increase the pressure. On dissection the trachea was found uninjured. He also tried to fracture the tracheal rings of a lamb (just removed from the body) by forcible compression between the thumbs, but did not succeed. He easily fractured those of a sheep by the same proceeding. The rings did not all break at the same line, but irregularly, the fractured ends, however, were quite smooth as if cut. Long, Stewart, and Hill in their evidence before the coroner, gave it as their opinion that the woman had been strangulated, most probably by the hands being placed behind the neck, and applied at the sides of the trachea, and that to produce the appearances found in the post-mortem examination, the cause could not have occurred after death, the antagonistic action of the air suddenly confined in the trachea being necessary for this purpose, that the appearances could not well be produced by the surgeon in removing the trachea; for the incisions were not near the parts injured; that the clot was seen, and the opening in the second ring found before the trachea was removed; that the parts were cleaned as much as possible with the handle of the scalpel, and Stewart was sure the cuts were made on cleaning the trachea after its removal from the body. Long directed attention to the lacerated mucous membrane presenting the appearance of being torn by a force operating from within, viz. by the expulsive efforts of expiration. He also pointed to the blood staining at the injured parts. The coroner committed the sailor to trial on the charge of murder, but the grand jury ignored the bill. It was understood

that they did so on the following grounds :—(1) That there was no direct evidence, supposing the woman had been murdered, that either or which of the individuals in question had done it. (2) The rupture of the trachea might have taken place during the act of vomiting (there was no evidence that she did vomit). 3. It might have occurred after death, by the neck falling upon the edge of the coffin. (4) That the surgeon might have produced the appearances described by his careless removal of the parts. Reviewing the case in 1867 Long writes: "It is probable that various opinions may be formed on this case, but at this distance of time, nearly twenty years, I feel assured the woman met with a forcible death. I do not say she was intentionally murdered, but a forcible compression may have been made on the trachea to prevent her cries, and the trachea ruptured by forcible compression on the one side, and attempts at expiration on the other ("Liverpool Medical and Surgical Reports," 1867, vol. 1, pp. 12–16).

12. **Alleged Strangulation.**—Hitherto the subject of strangulation has been considered in reference to the dead. But a living person may charge another with attempting murder under such circumstances, and here a medical jurist will have the duty of detecting and exposing the imposture. A case tried in France (*Affaire Armand et Maurice Roux*, March, 1864) has shown how easily medical men may be misled by a plausible story in forming their opinions. Impostors rarely produce such injury to themselves as to place their lives in jeopardy. The cord is loose round the neck; it is not so secured as to press with great force on the air-passages, to cause the tongue to protrude, or to produce lividity of the face or neck, or ecchymosis in the conjunctivæ and the skin. It is either a ligature or a rope which is used by the impostor: he does not commonly resort to manual violence to his throat. The marked feature of a really homicidal attempt is in the great amount of violence done to the neck; and the account given by the impostor will be inconsistent in its details, and not reconcilable with the ordinary effects of homicidal strangulation. Tardieu met with another case, in which a young woman, wishing to excite sympathy, alleged that she had been made the victim of a conspiracy. One evening she was found at the door of her room, apparently in a very alarming state: she could not speak, but indicated, partly by gestures and partly by writing, that as she was entering her room a man had attempted to strangle her by pressing his hand upon her neck, and at the same time had stabbed her twice in the chest with a dagger. On close examination the two stabs were found to have only penetrated to the outer clothing. But the most singular effect of the alleged attempt at strangulation was that, instead of producing a difficulty of speaking and alteration of the voice, it had been followed by complete dumbness. Tardieu could find on the neck no trace of any attempt at strangulation; and on assuring the young lady that the loss of voice under such circumstances could not last for more than a minute, she at once admitted that there was no foundation for the charge ("Ann. d'Hyg.," 1859, 1, 183).

A merchant was charged by his servant, Maurice Roux, with having attempted to murder him by strangulation. The case ended in a complete acquittal of the accused (*Affaire Armand et Maurice Roux*, "Ann. d'Hyg.," 1864, 1, 415). At 8 o'clock in the evening, Roux the accuser, a man in the prime of life, and also servant of the accused, was found in a cellar of his master's house stretched on the floor, his feet and hands tied: he was apparently strangled, and, it was said, almost lifeless. Under medical care, in less than three hours he, however, completely recovered. On the next morning (as he professed to be unable to speak) he informed those about him, by signs, that his master came upon him unexpectedly

while he was in the cellar, scolded him, struck him a severe blow on the nape of the neck (which knocked him down), attempted to strangle him, and then bound him with cords, and left him on the floor as he was found. These injuries, according to him, were inflicted at half-past eight in the morning, so that on his own statement he had been lying on the cellar floor in a hopeless state and unable to give an alarm, for more than eleven hours.

Armand denied the charge, affirming that the whole statement was a falsehood; and no motive could be suggested for such conduct on the part of a gentleman of position. No corroborative evidence could be adduced in support of the charge, and it rested simply on the word of one man against the word of another. Tardieu, with other medical experts, gave evidence for the defence. When the accuser was found, he was lying on his left side with his face towards the floor, and his legs were tied with a handkerchief which belonged to the accused. From Roux's position in the household, it was very easy for him to procure the handkerchief from his master's wardrobe. His arms were cold, his head and face of a natural warmth, the breathing stertorous or loud, the pulse scarcely perceptible, and the eyelid and eye almost insensible. There was around the neck a cord about one quarter of an inch in diameter: it was coiled three or four times round, and not secured by a knot. There were some marks about the neck, not ecchymosed, and widely separated from each other. There was no injury to the skin, and there were not such marks on the neck as the coils of this cord would have produced had it been applied with any force by an assailant. The cords bound around the legs and wrists were such as any one might apply to himself. As there was no swelling around them, it was obvious that they could not have been applied for upwards of eleven hours, as stated by the accuser, but only within a short time of his being discovered in the cellar.

The time assigned by this man for the malicious assault was fatal to his story. The cord round the neck had not been applied with sufficient force to interrupt respiration in any degree. This was not only proved by the absence of any marks on the neck corresponding to it, but by the circumstances, according to his statement, that he had been in the same position eleven hours. Had this been true, and the cord applied so as to produce the imminent symptoms of strangulation he described, he would have died from the effects within an hour after he had been so maltreated. Men who strangle others either draw a cord tightly, or secure it by a knot. The pressure to the neck is not so gentle as to leave no mark whatever, or to allow the strangled person to breathe and watch all that goes on around him for a period of eleven hours. There was therefore nothing in this man's state but what might have been self-produced: while, on the other hand, all the facts were inconsistent with the supposition of a homicidal attack having been made upon him by another. There was no trace of any blow on the nape of the neck, while the violence described, if really inflicted, would have left some strong evidence of its existence. In the absence of this there was a want of all corroboration of the charge. Although he stated that he was rendered insensible by the blow, yet he was able to observe and describe minutely the proceedings of the accused as to the subsequent strangling, and the binding of his legs and arms. No injury was done to the larynx in any way; yet the man

professed to be dumb, and unable to speak. It is highly probable that only shortly before he was discovered, this man had arranged the ligatures about his body.

The mixture of cunning and stupidity which characterises criminal acts was well exemplified in the case of the Dundee murder. In this case the prisoner went to the police station and informed the officer on duty that his wife had hung herself some days ago, but on the officer returning with him to the house there was no nail on the wall nor any mark to show that one had been there to which the deceased could have fixed the cord. The case was clearly one of homicidal strangulation; there was no defence, and the prisoner's conviction was fully justified (*Lancet*, 1889, 1, p. 696).

Here, again, it is obvious that circumstantial evidence must play a larger part than ever in establishing or rebutting such a charge; the cross-examination of the living is pretty sure to reveal the truth if all the points we have discussed be considered.

SUB-SECTION D.—SUFFOCATION.

DEFINITION OF SUFFOCATION.
SYMPTOMS OF SUFFOCATION.
TREATMENT OF THE SUFFOCATED.
POST-MORTEM APPEARANCES.
WAS DEATH DUE TO SUFFOCATION?
WAS IT ACCIDENTAL?

DEFINITION OF SUFFOCATION.

By suffocation we are to understand that condition in which air is prevented from penetrating into the lungs, not by constriction of the windpipe, but by some mechanical cause operating on the mouth and nostrils externally, or in the lumen of the throat, windpipe, and air-passages internally. In this sense it will be perceived that drowning is one form of death by suffocation, the water being an effectual medium for preventing access of air to the lungs.

The term suffocation is applied to various conditions, in which the symptoms and effects differ. There may be a simple privation of air; the air respired may not be renewed for the want of proper ventilation; or the air which is breathed may be mixed with certain noxious gases or vapours, which by absorption into the blood through the air-cells of the lungs, may, like poisons, destroy life. These will be found described under "Gaseous Poisons," *vide* Vol. 2). The symptoms preceding death, the disposition to recovery, and the post-mortem appearances in fatal cases, will differ under these circumstances. As regards simple asphyxia a committee of the Medico-Chirurgical Society performed a series of experiments on dogs, a tube being inserted into the windpipe; and breathing either took place or was completely arrested, according to whether the tube was kept open or closed by an accurately fitting plug. When the tube was closed the animal, after a variable number of seconds, made strong efforts to breathe; and when these ceased, unless air was speedily admitted, death occurred. From nine experiments on dogs, the average duration of the respiratory movements, after the animals had been completely deprived of air, was four minutes and five seconds. The average duration of the heart's action was seven minutes and eleven seconds; and it further appeared that, on an average, the heart's action continued for three minutes and fifteen seconds after the animal had ceased to make respiratory efforts. In respect to the rapidity with which death takes place in animals, the following conclusions were drawn:—1st, a dog may be deprived of air during a period of three minutes and fifty seconds, and afterwards recover without the application of artificial means; and 2nd, a dog is

unlikely to recover, if left to itself, after having been deprived of air during a period of four minutes and ten seconds. As in drowning, the shorter the interval between the last respiratory efforts and the readmission of air, the greater the chance of recovery ("Med.-Chir. Trans.," 1862, p. 454).

The results of these experiments in reference to the duration of life under privation of air may be considered applicable to a human being; and it may be fairly inferred that the life of a man would be destroyed in from four to five minutes after the power of breathing had been completely arrested. This must be considered only as an average under ordinary circumstances. Cases will be recorded below in which death seemed to be almost instantaneous when a foreign body blocks the windpipe, and under both "Hanging" and "Strangulation" we have referred (especially under "Garrotting") to the extraordinarily rapid onset of unconsciousness in such cases.

Smothering is a variety of suffocation, and consists in the mere covering of the mouth and nostrils in any way so as to prevent the free ingress and egress of air. Like drowning, hanging, or strangulation, it produces death by asphyxia.

SYMPTOMS OF SUFFOCATION.

These are sufficiently described in the above experiments as well as under the heading of "Hanging," but the above statement of sudden death must not be forgotten in this connection.

CAUSE OF DEATH IN SUFFOCATION.

It has been already stated that death takes place by asphyxia; and this occurs with a rapidity proportioned to the degree of impediment existing to the passage of the air. There does not seem to be any reason to attribute death to apoplexy. The congestion of the cerebral vessels may be regarded as a consequence of the disturbance of the functions of the lungs. If the veins of the neck were opened, so as to prevent an accumulation of blood in the vessels of the brain, it is pretty certain that the prevention of respiration would destroy life; therefore we may regard death from suffocation as resulting from pure asphyxia. While the editor feels bound to admit that such is usually the case, he cannot help feeling that this does not afford a thoroughly adequate explanation of the extremely rapid death in some cases; he is of opinion that some reflex process of shock must also be invoked, probably causing instant stoppage of the heart through the vagi nerves.

TREATMENT OF SUFFOCATION.

In *treating* cases of suffocation we have simply to allow of the renewal of air by removing, if this be possible, the obstacle to respiration. The results of experiments on dogs show that, even with a perfect closure of the windpipe, an animal may recover spontaneously after nearly *four minutes'* deprivation of air; and there is every reason to believe that a human being might recover after the same length of time. If five minutes have elapsed there will be but little hope of

recovery. Cold affusion to the chest should be used if efforts at respiration are not made spontaneously on the removal of the obstruction.

In hanging and in strangulation there is sometimes great violence done to the parts about the neck. In suffocation these accidental obstacles to recovery do not exist: the surgeon has simply to re-admit the air into the lungs. All experiments go to show that, even in this form of asphyxia which is most favourable for recovery, the complete suspension of respiration for *five minutes* is fatal.

Dr. Taylor thus in rather summary fashion dismisses the subject of treatment, and it must be confessed that it belongs rather to the realm of pure surgery and medicine than to that of Forensic medicine. At the same time the editor feels obliged to mention one or two further points, the advisability, for instance, of doing a preliminary tracheotomy in any long, and likely to be bloody, operation about the mouth and pharynx. Again, when a child or lunatic has choked himself with a mass of food, the speediest relief may be afforded by *instant* tracheotomy before efforts are made at removal of the obstruction, efforts which may under the circumstances of flurry only succeed in wedging the obstacle more tightly in the pharynx. If liquid or finely divided solid, such as flour, etc., be the cause of the suffocation, tracheotomy is obviously of no use at all.

POST-MORTEM APPEARANCES IN SUFFOCATION.

As in hanging, etc., these consist of—

General external appearances.

General internal appearances.

Special observation of the air passages, mouth, etc.

General External Appearances.—There are rarely any considerable marks of violence externally. When the body has become perfectly cold, there may be patches of lividity diffused over the skin; but these are not always present. In a set of cases examined by Tardieu, the skin of the face, neck, and shoulders presented dotted or punctiform ecchymoses ("Ann. d'Hyg.," 1866, 2, 346). The lips are livid; the skin of the face and neck may be pale, or present a dusky-violet tint; the eyes are congested; and there is a mucous froth about the lips and mouth.

None of these signs are at all characteristic, and the *absence* of all of them *is no proof that death did not occur from suffocation;* if they are present they certainly offer grounds for preliminary suspicion, and give a hint to the pathologist to be especially careful in examining the air passages; they are all of them more likely to be found the sooner the body is viewed after death. The mouth or nostrils may be found filled with some foreign material that has caused death, and in accidents the face and body or clothes may be covered with the same material, dust, mud, etc.

General Internal Appearances.—The *lungs.*—As regards general appearances these need not be found congested at all, and Dr. Taylor once found one congested and one quite natural. In general terms one may say that the slower death has been the more likely is congestion to be present, the more rapid up to instantaneous death the less the probability of the *ordinary* signs of asphyxia, and we must

again insist on the fact that the time after death at which the autopsy is performed has a very profound influence on the appearances. For the special points in the lungs *vide infra.*

The *heart* presents no special appearance indicative of the mode of death, if we except the presence of small spots of ecchymosis found below the investing membrane, like those met with on the lungs. They have been found near the roots or origin of the great vessels, and on the heart, but are not so frequently observed in this organ as in the lungs. The blood is generally dark-coloured, and very liquid. It does not readily coagulate. Thus it happens that any wounds made after death in the bodies of persons suffocated, bleed more and for a longer time than in other cases (Skrzeczka in Horn's *Viertel-jahrsschr.*, 1867, 2, 187).

The *stomach* and *intestines* have been observed to present patches of lividity. Casper has found the kidneys more strongly congested with blood than the liver, spleen, and other organs ("Ger. Leich.-Oeffn.," 1853, 1, s. 78). Ssabinski states that he has found the spleen in an anæmic condition; *i.e.* containing very little blood (*Viertel-jahrsschr.*, 1867, 2, 146).

The vessels of the *brain* are sometimes congested, but at other times they do not appear to be more than ordinarily full. Their condition may be affected by the congested state of the lungs, as well as by the slowness or rapidity with which death takes place. The punctiform ecchymosis met with on the lungs is sometimes observed on the visceral peritoneum also, and beneath the scalp. Again, it may be said that none of these features are constant nor characteristic.

Special Observations on Air Passages, Mouth, etc.—It must be here noticed that there are a very large number of different ways in which suffocation may be induced. The following is a rough classification that will be found to include most of them: 1. The close application of the hand over the mouth and nostrils, or the placing of a plaster or cloth over these parts, combined with pressure on the chest. This was formerly not an unfrequent form of homicidal suffocation. 2. Smothering, or the covering of the head and face with articles of clothing, etc., by which breathing is effectually prevented. In this group must be included "overlaying" of infants. 3. The accidental or forcible introduction of foreign bodies into the mouth and throat. 4. The flow of blood, pus, or even a gland, into the windpipe from a severe wound in the throat, or from the bursting of a bloodvessel or aneurismal sac. 5. In wounds of the throat, when the windpipe is completely divided, the lower end may be so drawn into the wound as to produce a closure of the orifice, and intercept the passage of air. One or other of these causes frequently operates to render a wound in the throat fatal. 6. The plunging of the face into mud, snow, dust, feathers, or similar substances. In all these cases death takes place from asphyxia, and with great rapidity if the chest sustains at the same time any degree of forcible compression. 7. Swelling or spasm of the glottis produced by the contact of corrosive substances or of very hot water.

It is obvious and well-known that Nos. 1, 2, and 7 cannot and do not leave such obvious traces (if indeed any) as the remaining causes will do.

Mouth, Throat, and Windpipe, and parts Adjacent.—It is very necessary to examine these carefully for either external marks (on skin round mouth, etc.) or for foreign substances.

Among many reported cases of death from suffocation produced by mechanical causes, the following are deserving of notice :—

1. A boy died in half an hour, under alarming symptoms somewhat resembling those of poisoning, and it appeared that a simple medicinal powder had been given to him about five minutes before the attack. On inspection the lower part of the windpipe was found blocked up with cheesy scrofulous matter: it was evident that the child had died from suffocation as a result of disease, and not from the medicine. 2. A child of eight years of age, while at play, was suddenly seized with symptoms as of a fit. He was quickly carried home, and became violently convulsed. Although retaining consciousness and speech, his countenance was extremely anxious, and he uttered the expression that he should die. In the hurry of the moment there was no opportunity of getting any distinct knowledge of the previous history, beyond the surmise that the boy had swallowed something. The windpipe was immediately opened, and a little air issued from the opening: artificial respiration was attempted, but without effect, as the child gave but two gasps after the operation, and died. An inspection revealed the presence of a foreign body in the upper part of the air-passages. The substance was whitish, and covered with mucus: on examination it was found to be a bronchial gland. Upon opening the windpipe the spot whence the gland had issued was perceived. 3. A man, æt. 31, was put to bed drunk, having previously vomited; and shortly afterwards he was found dead. There were the usual appearances of asphyxia, *i.e.* congestion of the lungs and fulness of the right cavities of the heart. In the upper opening of the windpipe (rima glottidis), was a thin and transparent piece of *potato-skin* so closely applied to the fissure as to prevent breathing. The man had died, accidentally suffocated from this mechanical cause. He had had potatoes for dinner the day before; the piece of skin had probably been thrown up at the time of vomiting, and had been drawn back by inspiration into the position in which it was found. Owing to intoxication, the deceased was unable to cough it up (*Edin. Med. and Surg. Jour.*, April, 1844, p. 390).

These are sufficient for our present purpose of illustrating the necessity for special care in examining the upper air-passages. We shall mention more cases in other connections.

Lungs themselves. (*a*) Congestion and vascular changes. We have already noted that congestion may or may not be present, the point we have here to notice is *extravasated* blood. Tardieu states, from his observations, that the *lungs* present a special character, which he states he has invariably noticed, consisting in the presence of small ecchymosed spots or patches beneath the pleura or investing membrane (punctiform or subpleural ecchymoses). He describes these spots as of a dark colour, and varying in size from a pin's head to a lentil. In the adult they are of still larger size. Their number is variable; sometimes five or six may be found, at others twenty or thirty; and in other cases the surface of the lung may be so studded with them as to give to it a granite-like appearance. These spots of ecchymosis are sometimes agglomerated, at other times separated, but their outline is generally distinct and well-defined on the surface of the lungs. They are most frequently seen at the root, at the base, and about the lower margin of the lungs. They are owing to small effusions of blood from ruptured vessels. They may be distinguished so long as the tissue of the lung remains unchanged. A similar appearance is also presented by the pericardium. Tardieu states that he has seen this subpleural ecchymosis in the body of an infant, ten months after death ("Ann. d'Hyg.," 1855, 2, 379). He admits,

however, that this condition may also be found in the bodies of children that have not breathed after birth: hence no inference of death from suffocation should be drawn from this appearance in the lungs of children, unless they have actually received air. In three instances he met with this appearance in lungs which sank in water, and had all the usual characters of these organs in a fœtal state. The children had been born living, prematurely, and under conditions in which life could not be perfectly established by respiration: one of them had made several cries without effectually receiving air into the lungs (*loc. cit.* See also Casper's "Klin. Novellen," 1863, p. 471). This struggle to breathe produces an appearance resembling the effect of suffocation. In new-born children that have died from suffocation, the thymus gland has been found in a similar condition. The same state is brought about by pressure on the umbilical cord before respiration takes place; and hence is not infrequently noticed in the cases of still-born children, when the cord has been for some time prolapsed during the act of parturition.

Liman disputes the accuracy of the observations of Tardieu regarding this appearance in death from suffocation ("Ann. d'Hyg.," 1867, 2, 388). According to Ogston, the subpleural or punctiform ecchymoses described by Tardieu as specially indicative of death by suffocation, were not present in the cases of nine adults who died from this form of asphyxia (*B. M. J.*, September, 1868). On the other hand, they have been found in cases in which death had taken place from different causes. Too much reliance must not therefore be placed on their presence or absence. These spots of ecchymosis were found by Ogston not only on the surface of the lungs, but on the heart, the scalp, the pericranium, the thymus-gland, and other parts ("Ann. d'Hyg.," 1868, 1, 104). That they are frequently absent in death from suffocation is shown by the observations of different medical jurists (See Ssabinski, *Vierteljahrsschr.*, 1867, 2, 146.) Lukomsky has endeavoured to show, by a variety of experiments, the circumstances under which we may expect to find these ecchymoses in death from suffocation, and the cases in which they are likely to be absent (*Ibid.* 1871, 2, 58).

The dotted appearance of the surface of the lungs in suffocation, when it exists, is not attended with the apoplectic effusions in their substance which have been met with in death from strangulation. Emphysema, or escape of air from rupture of the air-cells, is occasionally observed. The more rapidly suffocation has taken place, the more strongly marked is this appearance of the ecchymosed spots. On the other hand, when the interruption of breathing has been slow and gradual, the substance of the lungs is more congested with blood, and then these dots or patches are merged in the general violet colour of the surface of the organs. The lining-membrane of the windpipe and larger air-tubes is sometimes pale, but more commonly, when the lungs are much congested, reddened or dark-coloured. In the air-passages there is occasionally a frothy, reddish-coloured liquid, in small vesicles.

The editor from long experience in the post-mortem room, is able to affirm most positively that these subpleural ecchymoses are a very frequent phenomenon in death from all sorts of natural causes, but he would not be understood to thereby affirm that their presence is *not*

an indication of death from respiratory failure; this is no doubt very frequently, in ordinary clinical work, the *causa ultima* of death; he has also frequently noticed their absence when from this mode of death they might have been expected to be present. His fixed conclusion is, that by themselves their presence suggests some form of asphyxial death, but their absence cannot be used as any strong argument against such a form of death. Tardieu's original positive statement must therefore be modified in the above sense.

(*b*) *Foreign Liquids or Dust, etc., in the Air-tubes.*—The air-tubes should be cut open as far as a fine blunt-pointed pair of scissors will allow, and material of this sort looked for. Some years ago the editor met with an excellent illustration of the necessity of using the nose also in this part of the examination. The facts were as follows:—

A healthy adult at work as a compositor, one hot summer's day, in an upper room of a printing establishment, felt thirsty, ran down stairs to a neighbouring public-house, and ran back again to his work. He reached the door of his work-room, and fell down dead: at the autopsy the medical man was unable to account for death, and asked the editor to come and assist; on squeezing the lungs a dirty brown fluid was observed to pour out in some quantity. Struck by its colour the editor applied his nose to it, and found that it was beer, or at least a large admixture of that beverage. This point at once cleared up the matter, and showed that the man had been drowned in the vomited and aspirated beer.

WAS DEATH DUE TO SUFFOCATION?

The inspection of the body of a person suffocated presents so little that is peculiar, that a medical man, unless his suspicions have been roused by circumstantial evidence, or by the discovery of foreign substances in the air-passages, would probably pass it over as a case of death without any assignable cause—in other words, from *natural causes*. Liman has come to the conclusion that there is no anatomical appearance in any of the organs which can be considered as characteristic of this mode of death. The punctiform ecchymosis on the lungs and heart, described by Tardieu, cannot be treated as absolute indications of this mode of death (Horn's *Vierteljahrsschr.*, 1868, 1, 278). In examining the body of the woman Campbell, who was suffocated by Burke in Edinburgh (1829), Christison was unable to come to a conclusion respecting the cause of death until some light had been thrown on the case by collateral evidence. On this occasion a violent death was suspected, because there were marks of violence externally, and the face of the deceased presented some of the characters of strangulation. These conditions, however, are by no means essential to death from suffocation, and when they exist they can only be regarded as purely accidental accompaniments. Appearances similar to those found in the bodies of suffocated persons, if we except the dotted ecchymoses on the lungs, are frequently met with in inspections when death has taken place as a consequence of disease or accident. They can, therefore, furnish no conclusive evidence of the kind of death; and they scarcely permit a witness to establish a presumption on the subject, until, by a careful examination of the body, he has ascertained that there is no other cause of death depending on organic disease or on violence. Medical evidence, may, however, be serviceable in some instances. Thus the witness may have it in his

power to state that the appearances in the body are consistent with this kind of death; that the body is in all respects healthy and sound, and that death was probably sudden—as where, for instance, undigested food is discovered in the stomach. The presence of ecchymoses on the surface of the lungs may justify a strong opinion of death by suffocation when no other cause is apparent. In *Reg.* v. *Heywood* (Liverpool Sum. Ass., 1839), some of the witnesses referred death to suffocation, others to apoplexy (*Lancet*, September 14th, 1839, p. 896).

These difficulties become even more apparent in the case of children alleged to be overlaid or smothered by accident in bed (*vide* below).

In the case of Taylor (*vide* p.) 768 the medical inspectors considered that suffocation was not the cause of death, because "there was no appearance of congestion about the lungs." And it is desirable, in reference to future cases, to point out the fallacy involved in the assumption that congestion of the lungs is necessarily present in this kind of violent death. Watson observes that the gorged state of the right side of the heart and lungs is greatest when the act of suffocation (asphyxia) has been slow and gradual, by the excess of air to the lungs not having been completely prevented. When, on the other hand, death has taken place quickly and suddenly from this cause, there is little or no unusual congestion of blood in the lungs or heart ("On Homicide," p. 115). He describes (*Ibid.*, p. 118) a case of death from suffocation in which the lungs were natural; and in the case of Campbell, for whose murder by suffocation Burke was convicted in 1828-9, Christison and Newbigging found the organs within the chest perfectly natural, the lungs remarkably so, and unusually free from infiltration. The blood in the heart and great vessels as well as throughout the body was fluid and black (*Edin. Med. and Surg. Jour.*, vol. 31, p. 239). Again, in the case of Carlo Ferrari, for the murder of whom Bishop and Williams were convicted and executed in London in 1831, the lungs were quite healthy and *not congested;* the heart was rather small, contracted, and its four cavities were perfectly empty (Taylor's "Elem. of Med. Jurispr.," 1836, 292). The prisoners confessed that they had destroyed the deceased by suffocation. These cases are in some respects similar to those in *Reg.* v. *Norman*, in which a girl, æt. 15, was charged with the murder of four children by suffocation.

In reference to the case of Campbell, Christison observed, "that the conviction in the public mind that a well-informed medical man should always be able to detect death by suffocation simply by an inspection of the body and without a knowledge of collateral circumstances is erroneous, and may have the pernicious tendency of throwing inspectors off their guard, by leading them to expect strongly-marked appearances in every case of death from suffocation. That such appearances are very far from being always present ought to be distinctly understood by every medical man who is required to inspect a body and give an opinion of the cause of death" (*op. cit.*, p. 243). At the same time, in the absence of marked appearances to indicate violent death, due caution should be used by a medical witness in expressing an opinion. At the trial of the prisoner Burke, Christison restricted his opinion by stating that death by violence was, from the medical circumstances alone, *very probable*—a degree of caution which on similar occasions it

will be desirable for a medical witness to imitate. There is nothing in the act of suffocation, as there is in wounds, poisoning, hanging or strangulation, by which the hand of a criminal can be clearly and unequivocally traced.

The medical jurist should look for the special indications in the lungs of suffocation, the circumstances under which the body or bodies are found, the evidence of sudden death in the presence of food in the stomach, and, lastly, the absence of any other cause to account for death. All these sources of evidence may fail; and a medical opinion on the case may become little more than a conjecture. Still this may suffice when the evidence from extraneous circumstances is strong.

WAS IT ACCIDENT, SUICIDE, OR HOMICIDE?

We may, as before, analyse the evidence into that derivable from:—

1. Statistics.
2. Age and condition of the victim.
3. Signs of violence.
4. Nature of substance causing death.
5. Position of the body.
6. Circumstantial evidence.

1. **Statistics.**—The following figures are interesting, though of course they do not furnish very material evidence in any given case. They are taken from the Registr. Gen. Report for 1901.

Deaths from Suffocation, Accident and Negligence.

	Under one Year.	Under five Years.	Total at all Ages.	Grand Total.
In bed	1588	1622	1629	1964
Food or foreign body	50	67	140	
Smothered by heavy weights	0	2	15	
Otherwise	126	133	180	
Suicide				2
Murders and manslaughter				19

They show beyond any question the enormous waste of infant life brought about by accident! most probably by the so-called overlaying of infants by sleeping in the same bed with their parents.

Mr. Atkinson kindly gave the editor the following figures for 1902.

Return of Children Suffocated while in Bed, 1902 (England and Wales).

108, open verdict of coroner's jury; 1,600, "over-lain," verdict of coroner's jury, of which, 2 murder, 0 manslaughter; average during last ten years, 1,500 per annum.

For a paper on the overlaying of infants, by Dr. Wynn Westcott (a coroner of enormous experience in such cases), *vide B. M. J.*, 2, 1903, p. 1208, and also "Reports of Med.-Leg. Soc.," vol. 1. He there states that during the last ten years no less than 15,009 babies

have thus met their deaths; he discusses thoroughly the causes of, and cure for, this terrible condition of things.

2. **Age and Condition of Victim.**—Homicide by suffocation is not very common, except in infants, although it is a ready means of perpetrating murder. Hitherto the cases which have come before our Courts of law have been those either of infants, of the aged and infirm, or of persons enfeebled by illness.

Homicide by suffocation would probably not be attempted on a healthy adult person, unless he were rendered defenceless by intoxication.

As an accident, smothering may be conceived to take place when a person falls, in a state of intoxication and debility, so that his mouth is in any way covered, or the access of air to the mouth or nostrils is interrupted. On an inspection of the body the appearances described above will be met with in the lungs and heart.

The power of aspiration in the chest is exceedingly great, and drunken or helpless persons may, by falling in the midst of dust, ashes, or other substances, easily draw a portion of these substances into the air-passages, and thus die by suffocation.

The suffocation of new-born children by the introduction of substances into the mouth is not infrequent. The unnecessary force employed generally leaves traces of violence, which may be easily discovered by a careful examination, even should it happen that the substance used for the murderous purpose has been removed. Devergie has suggested an objection to evidence founded on a fact of this nature, that the substance might have been introduced soon after death, in order to create a suspicion of infanticide against the mother; but such an objection could hardly be received, and the fact would be only one out of many brought against an accused person. According to Devergie, the appearances produced by the introduction of a plug of linen into the mouth *during life* would be these:—The mouth contracting posteriorly, the pressure would be greater in this situation; consequently the blood would be forced out of the compressed mucous membrane of the palate. In the fore part the pressure would be less; and here the blood would accumulate, so that the mucous membrane in this situation would become swollen and red. In trusting to these characters, it must be remembered that similar appearances would probably result if the plug were introduced immediately *after death*, as also that, even when introduced during life, the characters might be lost if the plug were removed from the mouth before the body had entirely cooled.

It will be noticed that in such debilitated and young or old people circumstantial evidence must almost entirely be relied upon.

3. **Signs of Violence.**—If the person has been able to struggle, it is probable that marks of violence, in the shape of scratches or bruises, may be found about the mouth and nostrils, with bruises or marks of pressure on the chest, legs or arms, and a bloody mucous froth in the air-passages. The marks of violence may be slight, or even entirely absent.

Death by suffocation is most difficult to detect; and, unless the assailant has employed an unnecessary degree of violence, it is probable that the crime may pass altogether unsuspected (*vide* case, p. 767).

It is certain that most individuals would have it in their power, unless greatly incapacitated by disease or intoxication, to offer such a degree of resistance as would leave upon their bodies indubitable evidence of murderous violence. Death by suffocation may be considered as presumptive of homicide, unless the facts are clearly referable to accident. Accidental suffocation is, however, so palpable from the position of the body and other circumstances, that when death is clearly traced to this cause, it is not easy to conceive a case in which it would be difficult to distinguish it from one of actual murder.

In the case mentioned below of food in the air passages with signs of trampling on the body, the violence clearly established homicide.

4. **Nature of Substance Causing Death.**—Those instances of accidental suffocation that depend on disease or on the impaction of food, either naturally introduced into the mouth or by aspiration on vomiting, are easily detected by an examination of the body; generally speaking, they present no difficulty, provided that there is no violence, and circumstantial evidence is present. False teeth, again, but rarely can cause any difficulty either during sleep, or under any other ordinary circumstances. In some instances the very means that have been adopted to produce suffocation may forbid the supposition of accident, and clearly establish the fact of homicide. One case is elsewhere reported, in which a plug of dough had been forced into the larynx, and had caused death.

In fact, if the foreign substance is not food nor the material in which the face of the body is found, homicide will be strongly suggested, and especially so if it be not some natural object which a child could have obtained.

In the cases of corks mentioned below, the material strongly suggested homicide. Devergie mentions the case of a man who fell asleep near some sheaves of corn. He was found dead, and the cause of death was obviously asphyxia: an ear of corn was found fixed in the air-passages.

5. **Position of the Body.**—The following questions may here arise:—Was the position such as to be explicable on the supposition of accident? Was it in such a position as might have been brought about by a murderer? Could not the deceased have had strength or presence of mind to escape? Could he have been actually suffocated in the position in which his body was discovered? A little reflection upon the circumstances—for here something more than *medical* facts will be required—may enable a witness to give satisfactory answers to these questions.

If the body have been shifted a correct (diagrammatic it may be) drawing of the attitude in which it was found is very desirable, and even necessary, before any deductions can be drawn.

6. **Circumstantial Evidence.**—This must, after all, play a very leading part in determining the point we are now discussing. We have seen that the signs of suffocation may be entirely absent, so that only circumstantial evidence, even of the mode of death, may be present, quite apart from *how* it came about. Moreover, the points we have noticed in detail must be looked upon as in great measure circumstantial. In babies and young children discoverable motives for homicide will often form important links in the chain. The position

may be summed up by saying there are no hard and fast rules, each case must be judged on its own merits; in some, one single fact may be conclusive, in others all the facts will still leave a doubt.

We may now give brief details of a few cases, first of **accidental choking**:—

A child seventeen months old died suddenly during a violent fit of coughing. A full-grown pea was found firmly fixed in the larynx, between the cricoid and thyroid cartilages, blocking up the air-passages. It was probable that it had been in the air-tubes some time, as there was muco-purulent matter effused, and under a sudden fit of coughing it had been thrown into the position in which it was found, thereby causing death by suffocation.

In 1898, the editor admitted to the London Hospital a small child, who was suffering from laryngeal obstruction that had come on after taking some soup. Nothing could be seen, and the child died two days later, when a small rough piece of bone was found in the larynx; it had caused death by suffocation. In 1900, a man was found dead on the foreshore of the Thames. On autopsy the editor was able to state that death had taken place from aspiration of vomited particles of food (fish and vegetables).

Accidental suffocation from the impaction of large masses of food is by no means uncommon. If the glottis (the opening of the windpipe) be completely closed by food, death may take place suddenly. It does not follow, however, that a person so situated is incapable of making some exertion or of moving from the spot.

A man was suddenly choked by swallowing a large piece of meat: he immediately walked across the street to a chemist's shop, and soon after entering it he fell down in a state of insensibility. After death the throat was found to be filled with a piece of beef, which rested on the glottis, and had pressed the epiglottis forward. Part of the mass had entered the windpipe through the rima glottidis, and had thus caused death by suffocation.

The editor has met with a similar case. It is probable that, in this and similar cases, the foreign body does not so completely close the aperture as to prevent some degree of respiration, but the blood being imperfectly aërated, asphyxia is speedily induced.

A youth, æt. 17, lost his life owing to an oyster becoming impacted in the air-passages during the act of swallowing. In another, death was caused by a piece of potato which was found fixed in the trachea ("Ann. d'Hyg.," 1867, 1, 461).

A person has been charged with causing the death of another, when the cause was really owing to an accidental impaction of food in the larynx. An instance of this kind is reported in the *Lancet*, 1850, 1, p. 313.

The deceased had had a quarrel with the accused, and they were seen to fall to the ground together, while struggling and fighting. They were separated. About two hours afterwards the deceased, who appeared quite well, was observed to rise from the dinner-table and leave the room. He was found leaning against the cottage, as if in a falling position, and he expired in two or three minutes. The man with whom he had been fighting was charged with manslaughter. At the inquest the medical witness stated that he found the organs of the body, excepting the brain, in a very healthy state. The brain was excessively congested, and he attributed death to apoplexy. The coroner desired the witness to examine the mouth and throat (which he had omitted to do at the inspection), as from the suddenness of death after eating, he (the coroner) thought the man might have been choked. This opinion turned out to be correct. A large piece of meat was found wedged in the opening of the throat; this had caused death by suffocation. It had not completely closed the air-passages in the first instance; hence the man was able to move from the dinner-table. Lewin describes a case in which a soldier

was found dead in his cell two hours after his incarceration. On inspection it was found that a large piece of potato was impacted in the air-passages, and had completely prevented respiration (*Vierteljahrsschr.*, 1866, 2, 342).

In December, 1903, a man æt. 57, while lunching, fell forward in his chair and died. At the inquest the medical man stated that he found a piece of chicken weighing an ounce wedged in the air-passages. Verdict, misadventure.

A child was found dead in a room, with its face in the ashes under a grate: it had fallen during the absence of the mother, and, from its helpless condition, had speedily become suffocated. Some of the ashes were found in the windpipe (*Med. Gaz.*, vol. 17, p. 642).

In some instances a retraction of the base of the tongue may lead to the suffocation of a new-born child (*Seller's Jour.*, 1854, p. 278).

In new-born infants smothering is not an unusual occurrence, sometimes originating in accident, and at others in criminal design. An infant may be speedily destroyed by smothering. If the mouth be only lightly covered with clothing, or slightly compressed, so that respiration is interrupted, as in the act of carrying a child in the arms, this will suffice to cause death; and, as it has been already remarked, death may take place without being preceded by convulsions or other striking symptoms. Smothering is not often resorted to as a means of perpetrating murder, except in infants, or in debilitated and infirm adults.

In a case which occurred at Ayr, a woman was charged with the murder of her child by smothering it in her shawl. She was travelling on a steamboat: it was a cold and stormy day, and she had wrapped the shawl closely round the head of the child. The author has known an instance in which an infant was unintentionally destroyed by the close wrapping of a shawl round its head. In another case, a perfectly healthy child, about three months old, was found dead in bed. It had been left by the nurse in bed quite well in the morning when she got up. A quarter of an hour afterwards the father went into the room and could not see the child; but on removing the bed-clothes he found it beneath them, quite dead, its head completely covered by six folds of clothes. The body was quite warm, the countenance calm, and the limbs relaxed: there was a little frothy mucus about the mouth, but nothing to indicate a violent death. There was no doubt, from the circumstances, that the child had been accidentally smothered or suffocated; its body had slipped down beneath the clothes, the mouth and nostrils were covered—asphyxia speedily came on, and this proved fatal owing to the helplessness of the child.

Infants are frequently found dead owing to their being suckled at night while the woman is in bed. The child's face is pressed on the breast; mother and child fall fast asleep; the head slips beneath the clothes, and the child is then quietly suffocated (*vide supra*, "Statistics"). There is no mark of pressure on the body (*Lancet*, 1858, 1, p. 70). A child, five days old, died quietly on its mother's arm while lying in bed. There was much lividity about the head, neck, and back; but there were no marks of violence. The bronchial tubes of the right lung contained bright florid blood. The left lung was gorged with blood, but there was no effusion. The heart was firmly contracted, and there was only a small quantity of blood in its right cavities.

A groom was found dead, with his head downward, in the iron rack used for feeding horses with hay. His legs projected from the hole in the floor above. The space was so narrow that there had been no room to turn, and there was no fulcrum by which the deceased, who had thus fallen head downwards into the hole, could again raise himself. There was no doubt that, in reaching into the hole, the deceased had accidentally fallen head foremost into the rack in the midst of the hay; and he had died in this position, without the power to raise an alarm or to make any successful effort for his extrication.

It is possible that homicide might be committed in this manner; but there was no reason to suspect it in this instance. Singular accidents may lead to death by suffocation, in cases in which, unless the collateral circumstances were known, homicide might be inferred.

A man was engaged in shooting flour from the upper to the lower part of a granary; he fell through the trap-door, and a large quantity of flour fell with him and covered him. Nothing was known of the accident until his dead body was taken out below; it was then found that his mouth and nostrils were completely filled with flour, and that he had been suffocated. A policeman running along a road with two companions suddenly stumbled and fell forwards, with his head in the road and his feet and legs on the pathway. As he did not rise his companions went to his assistance and found him insensible. He was taken to St. George's Hospital, and he was then pronounced to be quite dead. On inspection it was found that the glottis (windpipe) was obstructed by three false teeth, which had been only lately put in: this obstruction had led to suffocation and death. Other cases are recorded in which suffocation had been caused by false teeth becoming displaced and falling back into the throat during sleep, in persons who had worn them during the night. In 1859, Dr. Stevenson rescued a woman from imminent suffocation by the prompt removal of a set of artificial teeth from the throat under these circumstances.

Infants often lose their lives by accidental suffocation in consequence of the reprehensible habit followed by nurses of stuffing into the mouth a little bag filled with sugar or other sweet material, in order to quiet the child. The bag is apt to be drawn by suction to the back of the mouth, and to mechanically shut off the air-passages. The detection of this dangerous practice can only be a matter of pure accident: hence a fatal case can be rarely the subject of a coroner's inquest, and even then medical evidence may fail to throw any light upon the cause of death. In one instance only did the author know it to give rise to a criminal charge.

(*Reg.* v. *Cox*, Warwick Lent Ass., 1848.) The mother, a pauper, was tried for the attempt to suffocate her infant, eleven days old. The child was discovered by another person with a piece of rag hanging from its mouth. It was livid in the face, but when the rag was removed, it made a violent gasp, and recovered its breath. There was no malice on the part of the prisoner, and she was acquitted.

Of **suicidal suffocation** the following are examples:—

A woman locked herself in her room with her young child, placed herself under the bed-clothes, and desired the child to pile the several articles of furniture in the room upon the bed. When the apartment was entered, some hours afterwards, the woman was found dead; she had evidently been suffocated. Had not the child clearly detailed the circumstances, a suspicion of murder would have arisen. In the Registrar-General's weekly return for June 9th, 1864, a woman is reported to have destroyed herself by leaning with her mouth against the bed-clothes; she died from suffocation.

In the case of a body found with a plaster covering the mouth and nostrils, or the traces of such having been applied, a witness might be asked whether this could have been so placed by the individual himself? Although no such case is reported to have occurred as an act of suicide, we are not on this account to say it is impossible.

Some singular cases are on record, in which persons have wilfully destroyed themselves by blocking up the throat mechanically.

An instance of this form of suicide is reported in the *Edin. Med. and Surg. Jour.*, vol. 57, p. 391. A woman confined in prison forced a hard cotton-plug into the

back of her throat. The cavities of the chest and abdomen had been already examined, and a medical certificate given that the deceased had died of apoplexy. The body was sent to one of the anatomical schools, and on re-inspection it was accidentally found that the throat was firmly blocked up with a plug of spindle cotton. A similar case was the subject of an inquest in London, in 1843. The deceased had thrust into her throat a large piece of rag, which had been used in applying a lotion. She speedily died suffocated, and after death the rag was found lodged at the back part of the throat. A case occurred at Maidstone in 1856, in which a man confined as a prisoner in a cell committed suicide by suffocation. He was found lying on his face, dead. He had thrown his bed on the floor, filled his nostrils with pieces of rag, his mouth with a handkerchief, and had tied another handkerchief over his mouth, after which he must have thrown himself down upon his face.

Some of these cases are likely to be mistaken for apoplexy, and they certainly show the absolute necessity for a careful examination of the mouth and air-passages in every instance of sudden death (See *Edin. Med. and Surg. Jour.*, vol. 54, p. 149; also *Med.-Chir. Rev.*, vol. 28, p. 410). Several cases have occurred in which lunatics have destroyed themselves by tearing up articles of woollen clothing or bedding, rolling up a shred into a conical plug, and inserting this into the back of the pharynx (*B. M. J.*, 1882, 1, pp. 42, 1246).

The editor met with a case of this nature in 1888; a lunatic tore his blanket to shreds and tried to swallow them till he choked himself. No doubt many similar instances pass without public record.

Cases of Homicidal Suffocation.—In February, 1904, Mr. J. H. Targett brought before the Medico-legal Society the following curious case:—

In 1893, a child of thirteen months of age was brought into Guy's Hospital with symptoms of laryngeal trouble; it died in a short time. Mr. Targett performed the autopsy, and found in the stomach two corks of the size to fit an ordinary medicine bottle, and in the pharyngo-laryngeal space a much larger one firmly fixed, and causing both mechanical obstruction and also inflammatory œdema. At the inquest false evidence was undoubtedly given, which allowed an open verdict to be returned. Ten years later, in consequence of anonymous letters, the case was re-opened at the Central Criminal Court in November, 1903, when the following evidence was given. The baby, a boy of four, and a man (the man and his presumed wife had taken the baby to lodge for payment) had been left for two hours alone in the room; on the woman's return, the child presented the symptoms for which it was admitted to Guy's Hospital. Mr. Targett repeated the evidence he had given ten years previously, and stated that in his opinion it was impossible for the larger cork at any rate to have reached and become fixed in the position in which he found it by accident.

Circumstantial evidence showed that the prisoner could have obtained the cork. He was convicted of manslaughter and sentenced to seven years' penal servitude; presumably the absence of motive and of deliberate intent to kill reduced the crime from murder to manslaughter, but of the homicide there could be no reasonable doubt.

A somewhat similar case has been reported by Littlejohn:—

In the body of a woman, who, it was stated, had died suddenly, a quart-bottle cork was found inserted tightly into the upper part of the larynx. The sealed end was uppermost, and was roughened by the passage of the cork-screw. Fractures of the ribs were found, and it was clear that deceased had not died a natural death.

It was suggested that the deceased, while extracting the cork from the bottle with her teeth, might, by the sudden impetus of the

contained fluids, have drawn it into the position in which it was found. But this theory was negatived by the sealed end of the cork being found uppermost in her throat, as well as by the structure of the parts. The medical opinion was that the cork must have been forcibly placed there by another person, while the woman was in a helpless state of intoxication. There was no reason to doubt that this was a deliberate act of murder. Five persons were present with the deceased at the time of her death, but it was impossible to fix with certainty upon the person who had committed the act; and the man on whom the strongest suspicion fell was acquitted on a verdict of "not proven" (*Edin. Med. Jour.*, December, 1855, pp. 511, 540).

A man was charged with causing the death of a child by administering to it a large quantity of pepper in powder (*Reg.* v. *Spaul*, C. C. C., September, 1872). From the medical evidence it appeared that death had been caused by suffocation, as the air-passages were choked up with pepper. The prisoner had used a pepper-castor, and the top came off, so that about half an ounce of pepper had found its way into the throat and air-passages of the child. The prisoner was convicted of manslaughter.

A man was struck several blows with the fist, he was then stabbed in the nape of the neck, and finally his body was trampled on by his assailants. He died before assistance could be rendered. The air-passages were found to contain a large quantity of pulpy matter such as existed in the stomach. The wounds received were only flesh wounds, no large blood-vessels having been injured. Nevertheless one expert attributed death to loss of blood from the wounds—another assigned it to asphyxia from the food vomited by the deceased having passed into the lungs during an inspiration. Engel and Hauska were able to prove that asphyxia was the cause of death. The food had been forced into the fauces by the act of trampling on the body ("Ann. d'Hyg.," 1868, 1, 450; 2, 226; and 1869, 1, 471).

This mode of death by suffocation, as a result of violence to the abdomen, is probably more frequent than is commonly supposed. It is likely to occur in the maltreatment of drunken persons, and during the commission of a rape. Behrend reported a case of this kind, with a full account of the post-mortem appearances, in which suffocation was caused by the aspiration of food (Horn's *Vierteljahrsschr.*, 1868, 1, 123).

Devergio reported a case, in which a man was suffocated by having his face forcibly thrust into a heap of corn. A quantity of the corn was found blocking up the mouth and nostrils, and some of the grains had been drawn into the air-passages by forcible aspiration, as well as into the stomach by swallowing, and even into the duodenum. That violence had been used was proved by the marks of indentations produced by the grains of corn on the face, as well as by excoriations (indicative of resistance) on the hands. The facts were quite inconsistent with the supposition of suicide or accident; yet the jury declined to accept the medical opinion, that the deceased had been homicidally suffocated ("Ann. d'Hyg.," 1852, 2, 195).

The presence of the grains of corn in the duodenum is not easily to be explained, considering the rapidity of death from suffocation, and that they could not be carried to the small intestine by aspiration or deglutition.

In 1862, a man and his wife, named Taylor, living at Manchester, were charged with the murder of a Mr. Mellor, and on searching their house their three children were found lying dead on the floor of a bedroom side by side. They were of the ages of twelve, eight, and five years. One of them had been seen alive on May 14th, and their dead bodies were first discovered early on the morning of May 16th. The children had on their nightdresses; and the bodies had been carefully laid out, with

the arms by their sides. There was no rigidity, but the skin of the abdomen had a slight greenish colour. In the opinion of those who first saw the bodies, the children had been dead from one to two days. The body of the eldest girl, æt. 12, presented no mark of violence around the neck indicative of strangulation. There was a recent bruise or scratch over the bridge of the nose, which had been produced during life. The surface of the brain was slightly congested. The lungs were of a reddish colour, full of air and not congested. The heart was natural, and the ventricles contained some fluid blood. In the stomach were four ounces of a fluid resembling barley-water, without colour, smell, or any other appearance to indicate the presence of a liquid or solid poison. There was no blood, and no undue secretion of mucus; the mucous membrane was pale. All the viscera were healthy, and revealed no cause of sudden death in any part. On the body of the second girl, æt. 8, a slight bruise was observed over the left eye, and another bruise over the shin-bone of one leg—both recent. The body of the boy, æt. 5, presented no mark of violence externally. In two of the children the pupils were dilated. Internally the appearances were similar to those found in the elder girl. All the organs were healthy, and there was no apparent cause of death.

The back of the throat and air-passages presented no obstruction from mechanical causes. The conclusions arrived at by the medical men were—1st, that these children had not died from any natural cause; and, 2nd, that they had not died from wounds, drowning, hanging, strangulation, starvation, or any of the ordinary causes of violent death. No trace of poison, by odour or otherwise, was found on examination of the stomachs and their contents. Portions of the intestines and contents, with some of the viscera from the bodies of two of the children, were found to be healthy; the intestines contained fæces, and were free from any indication of the presence or action of any poison. The children had died suddenly, at about the same time, and most probably from a similar cause. If death had resulted from poisoning—and only a powerful poison, in a strong dose, would be consistent with this state of facts—such a poison would probably have been detected either in the stomach or bowels. There had been no vomiting, and the poison had not passed off by the bowels; hence the case was most favourable for the detection of poison if it had been present. No poison could be traced to the possession of the accused. It was suggested that the children had been killed by charcoal-vapour or coal-gas, but this suggestion was not supported either by the appearances in the bodies, or by any of the circumstances of the case. Two sponges were found in the room in a wet state, and it was supposed that they had been used for applying the vapour of chloroform. Although this mode of death would leave no evidence after two or three days, yet it was considered improbable that such persons as the prisoners would have the knowledge to use chloroform [*vide* case in 1904, under "Poisoning by Chloroform," vol. 2.—Ed.], and this liquid could not be traced to their possession. There was no trace of chloroform on the sponges. As there was nothing medically inconsistent with death from chloroform-vapour it was not absolutely excluded under the circumstances. On a consideration of the state of the bodies, and the whole of the facts proved, the conclusions which the author drew, and which formed the basis of his evidence at the magisterial investigations, were—1. That these children died suddenly, and probably about the same time, from a similar cause; 2. That they did not die from any natural cause; 3. That they died either from suffocation as a result of smothering, or from the effects of chloroform-vapour.

No natural cause for sudden death could be suggested—not to mention the extreme improbability that three healthy children, well supplied with food, should die simultaneously from any natural cause, of which no trace could be found in their bodies. If we except the act of suffocation by smothering, no cause of violent death could be suggested. It is highly probable that these children were smothered while in bed on the night of the 14th. The state of the lungs and heart was consistent with this mode of death. The dotted appearance of the surface of the lungs, described by Tardieu (*supra*), if present, escaped the notice of the inspectors. There was a mark indicative of violence on the face of the eldest, and a bruise on the face as well as on the shin of the second girl—the two who were strongest, and therefore most capable of resisting. These marks, although slight, clearly indicated violence during life. The whole of the moral circumstances, including the writing on papers found pinned to the dead bodies, tended to show that three murders had been deliberately perpetrated, and no more probable cause of death could be suggested than that of suffocation by smothering.

Certain trials which took place some years since proved that persons in a state of intoxication or infirmity had been murdered by smothering, for the sake of the money derived from the sale of the dead bodies. It will be sufficient to mention the trial of Burke and Macdougall in Edinburgh, and of Bishop and Williams in London, as affording ample evidence of the existence of this horrible system of secret murder (see *Edin. Med. and Surg. Jour.*, vol. 31, p. 236). The victims were commonly destroyed by the assailant resting with his whole weight upon the chest, so as to prevent the motion of the ribs, and at the same time forcibly compressing the mouth and nostrils with his hands, to prevent the entrance of air. A case of this kind was referred to the author in 1831 (*Rex* v. *Eliz. Ross*, C. C. C., December, 1831). It was remarkable for the fact that the prisoner was convicted of homicidal suffocation, although the body of the deceased was never discovered (*Med. Gaz.*, vol. 38, p. 481).

A girl, æt. 15, was indicted for murdor by suffocation (*Reg.* v. *Norman*, C. C. C., July, 1871). She was a nursery-maid, and had the care of three children, the deceased, one of these children, being fifteen months old. There were three other charges of murder by suffocation against her, and one of an attempt to murder. There were suspicious marks of violence on the lower lip of deceased, as if produced by pressure of the mouth against some hard substance. The medical witnesses attributed death to suffocation by pressure on the mouth, but admitted that the marks might have been accidental. On this admission the prisoner was acquitted. On the trial for the attempt to murder, the girl was convicted, and the evidence given in this case threw a light upon the mode in which she might have porpetrated the four murders with which she was charged. A little boy, æt. 10, was heard to give a stifled cry of alarm while in bed. The prisoner was caught in the act of getting off the bed. The boy was in great agitation, and said that the prisoner had tried to strangle him while he was sleeping. He was awoke by feeling a hand on his mouth and throat. He tried to make a noise, upon which the prisoner, who was lying upon him, gave him a sweetmeat, and told him not to cry. His lips and throat were very sore. The prisoner was convicted and sentencod to ten years' penal servitude.

There can be no doubt that the four murders were all perpetrated in a similar manner, by burking—the children being helpless, and unable to give an alarm. Her detection "of the attempt" simply arose

from this child being older and better able to resist. The facts show that by medical science it is not always possible to distinguish murder by suffocation from accident.

In 1844, a man was convicted at the Assizes of the Seine of the murder of a woman by placing a pitch-plaster over her face. A trial for murder by smothering took place at the Lincoln Lent Assizes, 1843 (*The Queen* v. *Johnson*). The prisoner, while committing a burglary, tied the deceased to a bed, so that she could not move, and then tucked the clothes closely over her head : after remaining some hours in this condition the deceased died. The prisoner was convicted. [A very similar case occurred in October, 1904, at a newspaper shop in Stepney; two men were tried for the crime at the Central Criminal Court, November, 1904—verdict, guilty; sentence, death.—Ed.] For an important case, involving the question of death from homicidal smothering, or from apoplexy, see that of *Reg.* v. *Heywood* (Lancaster Sum. Ass., 1839).

SECTION XII.

SUICIDE.

Though throughout all the sections of this work dealing with violent deaths the question has had to be faced of whether the event was accidental, suicidal or homicidal, there has been no opportunity for considering the subject of suicide in all its bearings. It is discussed under the following points :—

Statistics.
Peculiar Methods of Suicide.
Suicide is a Felony.
Suicide in Admitted Lunatics.
How far does Suicide indicate Insanity ?
Suicide in Life Insurance.

STATISTICS.

Return of Suicides (England and Wales).

Year.	Suicides.	Attempts.
1901	3106	2116
1902	3239	2198
1897–1902 (average)	2980·2	2061·4
1892–1897 (average)	2694·4	1860·6

They are interesting to the statistician, and certain officials of State medicine have written articles dealing with the causes of the fluctuation in numbers year by year. Poverty and state of wages, the late Boer war, great periods of national excitement, and many other factors are found to influence the tendency to suicide.

PECULIAR METHODS OF SUICIDE.

We have repeatedly drawn attention to "evidence of design" as throwing light upon the question whether a given violent death were due to accident, suicide, or homicide. The following cases, taken from the *Lancet*, 2, 1901, p. 921, give excellent illustrations of the position :—

"One of the most extraordinary cases of this kind was recorded in the *Boston Medical and Surgical Journal* some twenty years ago, in which a man determined to guillotine himself. He constructed an apparatus by which a heavy axe-blade was held in place by a can of water. In the bottom of the can was a hole which allowed the water to run slowly out, and when a certain amount had escapod the axe-blade was liberated. The operator laid his head on some support, so that the axe would striko him on the neck, and placed a dish of ether in such a position that he would inhale it and so become unconscious before he was decapitated. The axe fell as he had intended. A strange attempt at suicide has been much quoted from our

columns. A man placed the point of a dagger against the skull in the frontal region and then drove it into his brain by a blow from a mallet. The blade, which was four inches long, was driven in up to the hilt; but assistance came on the scene, and the dagger was ultimately removed, the patient making a perfect recovery. A still more peculiar method of self-destruction was adopted by a man whose case was recorded in the *Medical Times and Gazette* in 1878. A man drove into his head two stone chisels, each being eight and a quarter inches long and three-eighths of an inch in diameter, using for the purpose a wooden mallet weighing 2⅝ pounds. One of the chisels was driven through the head from right to left, entering in the right temporal region and emerging in the left nearly in a direct line; the other chisel was driven into the centre of the forehead, penetrating half an inch into the frontal lobe. After inflicting the injuries the man approached a glass door, through which he was seen by two persons. He tried to open the door, but failed. When the door was broken open he walked a distance of forty feet with but little aid, and was able to talk. The chisels were withdrawn with much difficulty, and he died about five hours afterwards. In a case recorded in the *British Medical Journal* in 1881 by Mr. A. D. H. Leadman a man committed suicide by placing a dynamite cartridge in his mouth, lighting the fuse, and then awaiting the explosion. Great injury to the surrounding parts naturally ensued, but nevertheless the man lived two hours.

"A case was recorded in the *Lancet* of September 1st, 1877, in which drowning was accomplished by simply plunging the head into a basin of soup, and in another instance a woman broke the ice on a pond, thrust her head through the hole, and so perished.

"Although homicide is frequently committed by throttling with the hands, suicide in this way is, of course, exceedingly rare.

"A case, however, was recorded in the *Zeitschrift für Medicinische Beamte* of a woman, aged forty years, who suffered from melancholia, and who had previously made several attempts to commit suicide. She was found dead crouched in her bed with both hands compressing the throat; death had undoubtedly ensued from throttling. Death from strangulation by hanging is common, but sometimes a noose is used in a different way, the active strength of the suicide supplying the force that is usually supplied by his passive weight. An insane patient, upon whom Professor Böllinger (Friedreich's *Blätter für Gerichtliche Medicin*, Part I., 1889) performed a necropsy, had succeeded in ending his life by strangulation of this sort. The body was found lying on the back with the right foot pressed against a bedpost. Round the neck was a loop-knot made of a bed-sheet torn in two, one end of which was attached to one of the bedposts. The deceased, by pressing his foot against the opposite post, had drawn the noose tight, and so maintained it, thus bringing about strangulation.

"Suicides occasionally select particularly painful means of ending their lives.

"For instance, in a case related by Mr. L. E. W. Stephens in the *Bristol Medico-Chirurgical Journal*, 1888, a man suffering from melancholia was seen with a red-hot iron rod, about two feet in length, the cool end of which was against the wall and the heated end against his abdomen. He was interrupted in this attempt, but not long afterwards he made the iron white-hot and succeeded in thrusting it four or five inches into the abdomen. In yet another case the dead body of a man with extensive burns was found lying on an iron bedstead. A burnt candle was beneath the bedstead. From papers in the room it appeared that the man wished to prove that suicides were not cowards, and he had adopted the following awful method of terminating his life in order to prove his theory. He had laid on the bed over the lighted candle, rising from time to time to record his sensations, and then resuming his position on the bed.

"Many cases similar to the above, all of great medico-legal value as demonstrating what suicides may accomplish in the way of inflicting injuries upon themselves, are recorded. On superficial examination homicide may be suspected, whereas other evidence may conclusively

prove the case to be one of suicide. Doubtful cases of this kind need the greatest care on the part of the examining practitioner, for on his evidence may depend in a great measure the verdict of the jury."

The following, also from the *Lancet*, are of interest in the same connection of peculiarity :—

A young woman jumped from the suspension bridge at Clifton and fell about 300 feet; her clothes acted as a sort of parachuto, and she was picked up alive and none the worse for the fall except for a few bruises. On being questioned she stated that she remembered nothing of her actions for some hours beforo she walked to the bridge, and until she found herself in the infirmary. A man has been known to swim across a river in order to throw himself under a train. Occasionally, however, most extraordinary methods have been chosen. In the *Lancet* of September 14th, 1901, wo published a case of suicide in which the wounds were inflicted in the back of the neck, and in our issue of Septomber 28th (p. 876) we wero reminded that we had described two similar cases some years before. More than one case is on record in which the entire larynx had been self-removed (*Lancet*, 2, 1901, p. 921).

Mr. Troutbeck recently held an inquest as to the death of a patient named Joseph Green, who was in King's College Hospital. A lad, who was a patient in the same ward, noticed that Green was acting strangely. There were movements under the bed-clothes as if Green were stabbing himself in the abdomen, and he subsequently pulled the clothes up level with his eyes and seemed to be injuring his face. On examination a wound eight inches long was found in the abdomen, and an incision seven inches long on the left side of the neck. He died the same night. Suicide by hanging has occasionally been accomplished in bed. A case is recorded of a girl who thus killed herself by merely securing a cord to the frame of the bedstead and then leaning back in bed, the tension so produced being sufficient to cause the necessary constriction of the neck. Two other girls who were sleeping in the same bed were not awakened. Another strange case is that of a woman who laid herself on a bed, attached the running noose of a rope round her neck, tied the other end of the rope to a heavy piece of metal, which she threw over the iron bar of the bed frame, and was thus strangled. Suicide by smothering is also rare, but an instance occurred in France in which a woman placed herself under the bed-clothes after desiring her little child to bring all the cushions, clothes, and other similar articles that were in tho room and to pile them on top of her. The child did so, and some hours afterwards the woman was found dead. A woman in an asylum, aged thirty-eight years, was found early one morning dead in bed with part of a stocking protruding from her mouth, death having resulted from suffocation. No noise or disturbance was noticed by other patients who slept in the same ward. At the inquest a long stocking was exhibited, which, with great difficulty, had been removed from the air-passages (*Lancet*, February 14th, 1903).

The following most extraordinary case is taken from the *Lancet*, 2, 1901, p. 744 :—

A man, aged sixty-three years, of intemperate habits, who had previously complained of pains in the head and body, committed suicide on September 2nd by cutting through the back of his neck with a razor in a terribly resolute manner. The police-constable called to the case found the man in a corner of his bedroom seated on a low trunk with his head resting against the wall. A blood-stained razor, lying open, was close to him. The body had been removed to the bed before I arrived. An examination of the body and its surroundings revealed nothing suggestive of foul play; on the contrary, the hands afforded strong confirmatory evidence of the wound having been self-inflicted. Examination of the wound showed that three separate attempts had been made. The first incision passed from left to right through skin and fascia without wounding the underlying muscles. Starting from a point one inch below the left mastoid process, and half an inch above the level of the transverse processes of the seventh cervical vertebra, it passed in a slightly upward direction to a point a quarter of an inch below and three-quarters of an inch behind the angle of the jaw on the right side, here tailing for a quarter of an inch. The second incision, unlike the first, passed from right to left. It started from a point one inch behind the digastric groove (right side), dividing both skin and fascia for half an inch; then, entering the wound made by

the first incision, it cut partially through the trapezii and splenii, becoming superficial at a point a quarter of an inch behind the lobe of the left ear, and tailed for one-eighth of an inch. The third incision started from below the right mastoid process, descended for a quarter of an inch to meet the first incision, and then passed from right to left deeply through all structures to the interval between the atlas and the axis. Entering the spinal canal in that interval, it opened up the theca vertebralis and slightly wounded the posterior columns of the cord, and having notched the transverse process of the axis (on the left side), became superficial by passing below the lobe of the left ear with a tail carried across the left cheek to the anterior border of the masseter. The whole three incisions were made by the razor while held in the *right* hand—no easy task to accomplish. In the absence of a post-mortem examination, it is hard to state the immediato cause of death. As might be anticipated from the regional anatomy of the parts, hæmorrhage was but slight, and death could not be attributed to loss of blood. The shock caused by the rapid loss of cerebro-spinal fluid is probably a factor of more importance. No dislocation of the vertebræ took place, so that there was no pressure on the cord from this cause.

On this case the editor would remark that, if the circumstantial evidence proving suicide is quite reliable, the case must be unique in the nature of the injuries, and must cause a medical jurist to hesitate very much before swearing that *any* wounds of the throat were definitely homicidal.

SUICIDE IS A FELONY.

The law of England treats suicide as a felony; those who have attempted and failed in the perpetration are held to be sane and responsible agents, unless there should be clear evidence of their (intellectual) insanity from other circumstances; and it is certain that the evidence required to establish this must be much stronger than that sometimes admitted in cases of homicide. Recently the law relating to the interment of suicides has been altered materially. By the Interments (Felo de se) Act, 1882 (45 & 46 Vict. c. 19), the laws and usages relating to the interment of the remains of persons against whom a finding of *felo de se* has been returned, are altered and amended. Instead of directing the remains of such a person to be buried in a highway, with a stake driven through the body, the coroner is to direct the remains to be interred in a churchyard or other burial ground of the parish, subject to the provisions of the Burial Laws Amendment Act, 1880. It was hoped that this enactment would do away with many absurd verdicts of "Temporary insanity," but it has failed to do this.

In the first volume of the transactions of the Medico-legal Society (London), is an exhaustive article by Mr. R. Henslowe Wellington on this subject, to which the reader is referred for many interesting details on the history of *Suicide*, including that of the very word itself. Mr. Wellington there traces the changes in the law that have taken place in the last century, especially with reference to the different results which ensued upon a verdict of *Felo-de-se*, or upon one of "suicide while temporarily insane." He points out that since 1870 there has ceased to be any difference except in the absence of ritual at the burial, and that since 1880 or 1882 even this difference is by permission abolished. Notwithstanding this gradnal approach to rational procedure, the public mind is still swayed by old ideals, and a verdict of *Felo-de-se* is thought to be a disgrace, while one of "Suicide while temporarily insane" is held in some measure to mitigate the blow.

Some singular medico-legal cases have occurred, involving the question how far the act of attempting suicide involves responsibility.

In the case of *R.* v. *Rumball* (Central Criminal Court, May, 1843), a woman was charged with attempting to drown her child. It appeared in evidence that she had fastened her child to her dress and thrown herself into a canal with the intention of destroying herself. She was rescued, and subsequently tried and convicted of the felony of attempting to murder her child by drowning. Had she not been rescued, and had she succeeded in her purpose of self-destruction, it is probable that the verdict of a jury would have been, as it so frequently is on these occasions, "Temporary insanity." In *Reg.* v. *Furley* (C. C. C., April, 1844), the prisoner was convicted of murder upon similar grounds, but the sentence was subsequently commuted. In *Reg.* v. *Gathercole* (1839), a man was charged with manslaughter under the following singular circumstances:—The prisoner threw himself into a canal for the purpose of drowning himself; the deceased, who was passing, jumped in and rescued him, but by some accident he himself was drowned in the attempt. The defence was, that the prisoner was at the time insane, and therefore not responsible for the death of the person who attempted to save him; but this was negatived, and the prisoner was convicted.

So if a man intending to shoot himself fails, and by accident shoots a bystander, he will be held responsible, unless there be a clear proof of intellectual insanity; the act—the attempt itself, taken alone—will not be admitted as evidence of this.

In *Reg.* v. *Fisher* (Taunton Spring Ass., 1865), the prisoner was indicted for the murder of his wife by poison. It appeared from the evidence that they had been married fourteen years, and had lived happily together. The man was well conducted and industrious, but he fell into a desponding state of mind, and thought that by the introduction of machinery into his trade of a shoemaker he and his wife would be reduced to poverty. He communicated this feeling to his wife; they pondered over it together, and they both agreed to destroy themselves. The man procured a quantity of laudanum, and shared it with his wife, each taking about an ounce. The wife died, but owing to early vomiting the prisoner recovered. It was proved that before marriage the prisoner had been confined in a lunatic asylum; still, he had perfectly recovered, and just before this occurrence it was observed that both husband and wife were low and dispirited. There was then no indication of intellectual insanity about him, and the only delusion appeared to be that machinery would ruin his trade. In answer to the charge he said, "According to my notion I am not guilty of murder." The case is like that of many others—of two poor, weak-minded, infatuated people agreeing to commit suicide. Under the direction of the judge, the jury returned a verdict of guilty. In *Reg.* v. *May* (C. C. C., November, 1872), in which a young German was indicted for aiding and abetting the deceased, a youth named Nagel, in an act of suicide, that ruling was thus affirmed:—

If two persons agree to commit suicide and one only dies, the survivor is guilty of murder. If one persuades another to kill himself and he does so the adviser is guilty of murder (*Rex* v. *Alison*, 8 C. & P. 418).

"Any person in aiding and abetting another in committing suicide is guilty of murder, and it makes no difference if the two agree to commit suicide together. If one of the two causes his own death, and the other is present at the time aiding and abetting him, and attempts also to kill himself but fails, the second is guilty of murder, for the attempt at self-destruction does not affect the crime committed against the other."

For an illustration of the difficulties that may arise in hospitals from this legal position of attempted suicide *vide Lancet*, 2, 1903, p. 1329. The police ordered that such cases should not be admitted

to a particular general hospital because the hospital authorities could not or would not pay for police watching. In the editor's opinion such police watching is detrimental to everybody, and a nuisance to the hospital.

If both succeed no process can issue.

The view that a judge takes of attempted suicide varies enormously, and is mainly, one might say entirely, influenced by the circumstances of the case. Many miserable creatures whose main offence besides the attempt is simply poverty and misery are discharged either with a caution or on the recognisances of themselves or their friends; others are ordered to be detained in asylums as simple lunatics; comparatively few are severely punished. Of the latter the following are examples:—

At the Central Criminal Court, early in 1904, a man was condemned to a term of imprisonment under the following circumstances:—He and his wife had fallen into pecuniary distress through his drunken and idle habits. This led to much quarrelling, and finally he seems to have bought some poison, which he took himself and (more or less) compelled her to take; she died, but he survived.

The following is a more complicated case: the report is taken from the *Lancet*, vol. 1, 1901, p. 715 (*R.* v. *Eddington*, C. C. C., March, 1901):—

Maud Eddington was indicted for the murder of her sweetheart, John Bellis, on January 14th, 1901. The coroner's jury returned a verdict to the effect that the prisoner intended to commit suicide, and that in the struggle for the possession of the revolver the deceased was accidentally shot. Subsequently to this finding further evidence was forthcoming. The charge at the police court was continued, and the prisoner was committed for trial. The evidence, partly confirmed by the statement of the accused, showed that she had felt some resentment against the relatives of the deceased with whom he lived, for having, as she believed, slighted her and tried to cause an estrangement between her and her *fiancé*, and that this resentment had later been extended to him. The scene of the tragedy was a small closely packed oil and colour shop. On the afternoon of January 14th a tramcar conductor heard the sound of shots. Upon going into the shop he found the deceased in a crouching position, insensible, and bleeding from wounds in the head. In one hand was a string which held some brushes together. A similar bundle had evidently dropped from the other hand. Eddington was lying at full length on the floor with her head towards the door. Between the two stood some steps. At the far end of the counter beyond the man was some blood which had apparently fallen on the floor. Some five feet or so distant, and close to the right of the deceased, was a quantity of blood that had run down from his head. The deceased had two bullet-wounds, one of which passed obliquely downwards from left to right through the upper lip, the other one and a half inches behind the left ear. The shot which had caused the latter had gone through the lateral sinus and lodged against the opposite side of the skull. The prisoner had a graze and some small blisters on the right side of her forehead. Deceased did not regain consciousness before he died six and a half hours after the injury. The prisoner said that she had written a letter to deceased telling him of her intention to shoot herself in his presence. This letter was not discovered, but an envelope in her handwriting and bearing the date she named was found in a locked box belonging to the deceased. A letter which had been written by her at her home she had torn up and thrown into the fireplace. In it were the words, "he shall lose everything." The prosecution relied on this as proving malice, but for the defence it was contended that the letter was torn up because it did not truly represent the feelings and ideas of the accused woman.

The facts and suggestions put before the jury in seeking for a conviction on the capital charge were: (1) a motive of revenge for neglect and unrequited love; (2) the statement in the letter before referred to; (3) that the steps stood between the two persons; (4) that the clothes of the accused

were not disarranged and that there was no blood upon them ; (5) that the objects of merchandise in close proximity had not been disturbed ; (6) that the man was holding in his fingers the string which tied the brushes together ; and (7) that the two patches of blood were some distance apart, with no intervening marks. Lord Coleridge, for the defence, contended that the man was accidentally shot whilst endeavouring to wrest the revolver from her, and the prisoner swore that Bellis seized the weapon in his left hand and it went off in the struggle. The jury adopted this view and acquitted the prisoner, who pleaded guilty to the further indictment of having fired with intent to kill herself. The judge for this offence sentenced her to fifteen months' hard labour, remarking that by her wicked and foolish act she had sacrificed the life of the deceased who had, by a praiseworthy act—according to the previous finding of the jury—tried to save her life.

At the June Suffolk Assizes, 1904, Harry Ambrose, nineteen, a mat weaver, was sentenced to six months' imprisonment for attempted suicide. Prisoner's sweetheart threatened to drown herself, and Ambrose accompanied her to a shallow pool, in which both lay down, but prisoner got up and ran away on hearing his companion scream. The girl was drowned, but the jury acquitted Ambrose of aiding and abetting her to commit suicide.

SUICIDE IN ADMITTED LUNATICS.

In former times suicidal mania was a name given to a special class of unsoundness of mind, but the name has long been discarded for any class, as it is now recognised that almost any person of unsound mind may thus kill himself if time, opportunity, and the means coincide in the suggestion of self destruction. It may proceed either from sudden impulse or be the result of long deliberation ; it may be committed with or without apparent motive ; it may proceed either from a delusive or a real apprehension of poverty, disgrace, or ruin. Suicide from sudden impulse is not uncommon : persons have been known to destroy themselves who had not previously manifested any symptoms of *intellectual* disorder.

Winslow remarks "that a person is often impelled to self-destruction by the overpowering and crushing influence of a *latent* delusion that has for weeks, and perhaps months, been pressing like an incubus on his imagination. Patients sometimes confess that they have been under the influence of monomaniacal ideas and terrible hallucinations for a long period without their existence being suspected even by their most intimate associates. 'For six months,' writes one patient, 'I have never had the idea of suicide, night or day, out of my mind. Wherever I go, an unseen demon pursues me, impelling me to self-destruction. My wife, friends, and children observe my listlessness and perceive my despondency, but they know nothing of the worm that is gnawing within.' Is not this a type of case more generally prevalent than we imagine ?"

Men thus mentally affected generally retain a certain control over their actions ; thus they will voluntarily give up pistols, razors, or other weapons by which suicide might be perpetrated. A friend suffering from an attack of suicidal mania, while residing with the author in Paris in 1830, delivered to him one night his razors, with a request

that he would lock them up and keep them out of his sight, as otherwise he feared that he might destroy himself at any moment. Although he recovered from this attack, he had a relapse, and subsequently destroyed himself by taking prussic acid. Persons labouring under this form of monomania may go to bed perfectly collected, and suddenly awake in the night and destroy themselves by hanging, drowning, or precipitating themselves from a window. These cases probably depend on the persistence of some horrible hallucination which may have occurred in dreaming, and in the reality of which they cannot at the time disbelieve. Some years ago a case of this kind was in Guy's Hospital. The man attempted to strangle himself in the dusk of the evening with the cord of his bed; he was fortunately saved, and he recovered after having been nearly strangled. On asking him what led him to the attempt, he said that he suddenly saw a large black figure round his bed (the devil), which by signs and words compelled him to try and hang himself. It appeared that this man had previously shown symptoms of suicidal mania.

When the impulse to suicide is checked by any great moral shock, it may suddenly disappear. The friend whose case is above referred to, recovered under the shock from the sudden outbreak of the French Revolution of 1830. The danger to which he was exposed, while residing in Paris in the early days of the Revolution, for a time at least dispelled the idea of self-destruction. Pinel mentions the case of a man who, while hurrying to one of the bridges of Paris to throw himself into the river, was suddenly attacked by robbers; he made a desperate resistance, and escaped from them. He could not then account for his being where he was, and quietly walked home, having abandoned the intention of destroying himself.

Suicidal impulses are susceptible of being spread by imitation, especially when the mode of self-destruction adopted is accompanied by circumstances of a horrible kind, or by such as to excite great notoriety. The sight of a particular spot where an act of suicide has been already committed will often induce a person, who may hitherto have been unsuspected of any such disposition, at once to destroy himself. Thus a second and a third suicide took place from the Monument near London Bridge, soon after the first had occurred. The same remark may be made of the numerous suicides from Waterloo Bridge.

The following is an excellent example : it occurred in June, 1904, at the Lincs. County Asylum :—

> In one of the male wards a patient had been talking of a woman in London who swallowed a fork and lived five years afterwards, and a lunatic, named Willerton, evidently became imbued with the idea of emulating the feat, for when next he secured a fork he placed it, haft foremost, in his mouth. Noticing the act, an attendant rushed across the room, but before he could reach him Willerton had thrown his head back and pushed the fork, nine inches long, completely down his throat.

HOW FAR DOES SUICIDE INDICATE INSANITY?

Suicide is often set down as furnishing positive evidence of insanity: a doctrine which commonly finds expression in the verdicts of coroners' juries—not so much from the fact of insanity being thereby

established, as that any verdict but this would weigh heavily on the surviving relations and friends of the deceased (*vide supra*).

In the opinion of Davey, the suicidal propensity is in all cases and under all circumstances a positive sign or symptom of disordered mind (insanity) (*Jour. of Ment. Sc.*, 1861, p. 110). This, however, is not in accordance with the views of many psychologists. In one case a person will fancy that he is constantly watched—that he is oppressed and persecuted by all around him, and that his prospects in life are ruined, when, on the contrary, his affairs are known to be flourishing: he destroys himself under this delusion, in order to avoid imaginary evils. In cases of this description, whether arising from a momentary insane impulse, or from delusive reasoning, there cannot be a doubt that the act is one of insanity. It is very different, however, when a real motive is obviously present—as when a person destroys himself to avoid actual disgrace or impending ruin. The motive is here based on a reality—on a real estimate of a man's social position; the results are clearly foreseen, and the suicide calculates that the loss of life would be to him a smaller evil than the loss of honour and fortune. It may be urged that a motive of this kind is itself delusive, and will appear insufficient to the minds of most men; but what known motive is there sufficient to account for parricide, infanticide, or any other crime of the like horrible nature? We must allow either that all crime is the offspring of insanity, or that suicide, like infanticide, may be the deliberate act of a *sane* person. To affirm that suicide is always *per se* evidence of insanity is to affirm, substantially, that there is no criminality in self-murder: for it is impossible to regard that act as a crime which is committed under a really insane delusion.

For further remarks *vide* Savage's "Insanity," p. 188, also below in "Insurance Cases."

From Shakespeare's time, "or that the Almighty had not fixed His canon 'gainst self-slaughter," suicide has been mixed up with the dogmas of religion to such an extent that many people would consider it impious to express the view that suicide no more indicates insanity than does the destruction of a favourite animal which is in great suffering, yet any one with ideas built on rationalistic principles must recognise that the statement is true, unless indeed we are to consider all nations like the Japanese and Chinese potential lunatics.

The tendency to suffer from a form of lunacy in which suicidal tendencies are strong appears to be not infrequently hereditary.

Burrows relates an instance in which this propensity declared itself through three generations. In the first the grandfather hanged himself. He left four sons —one hanged himself, another cut his throat, and a third drowned himself in an oxtraordinary manner, after having been some months insane: the fourth died a natural death, which, from his eccentricity and irregularity of mind, was scarcely to be expected. Two of these sons had large families: one child of the third son died insane, two others drowned themselves, another became insane and made the most determined attempts on his life. Several of the progeny of his family, being the fourth generation, when they had arrived at the age of puberty, showed a tendency to the same fatal propensity.

There comes in here this curious anomaly that a jury will at one time, out of pity for the living, declare that suicide does indicate insanity, and at another time, out of disgust for crime, declare that it

does not, whereas neither pity nor disgust existing in the minds of the jury can by any conceivable possibility have any bearing on the real state of mind of the self-murderer.

There are no doubt hundreds of cases, one might say thousands, in the course of a few years where "Insane" is a correct verdict. For instance, those cases in which the victim is actually under detention in an asylum, or again where disease known to affect the mind has just been present, as in the following case that occurred in a large Hospital in London.

The victim was a man of middlo age recovering from an attack of *delirium tremens*, in which to protect himself and others he had been confined in a strait-waistcoat, and in a room with windows and fire (as it was thought) sufficiently protected by bars. As convalescent he was allowed freedom in the room. During the temporary absence of the nurse, he put his fist through the window, took out a piece of glass, and with it cut his throat so deeply, that he died from hæmorrhage before Dr. H. reached him, though within the building.

The adoption of more than one method of self-destruction may reasonably be taken as a circumstance pointing strongly in the direction not only of suicide as opposed to accident or homicide, but also of insanity, or to say the least of it a very great upset of mental balance when the deed was committed. The two following taken from the daily press in 1904 are sufficient as examples.

A lady named Hunter, a widow, possessed of considerable wealth, but living alone in Barber Road, a suburb of Sheffield, met with a sad death. On Wednesday she was visited by a friend, who did not gain admittance, Mrs. Hunter, who had a shawl clutched round her neck, waving her away from the door. As nothing was heard of the lady next day, the house was broken into and Mrs. Hunter discovered dead in the drawing-room, with a great jagged wound in the throat. In the kitchen was found a blood-stained knife and a glass containing oxalic acid. It is believed deceased had cut her throat about the time of the friend's visit, and subsequently swallowed the poison.

Mr. S. Brighouse held an inquest at the St. Helens Town Hall on the body of Thomas Blow, aged 70, an ex-attendant at Charing Cross Station, who was found drowned with his throat cut in a private bath at the Corporation Baths in Boundary Road. The evidence showed that deceased engaged the bath from an attendant, and whilst the latter was filling the bath deceased appeared to be in a very cheerful mood. Afterwards the superintendent went along the corridors in the usual course of his duties, and seeing the door still locked, he shouted out, "Are you all right?" Not getting an answer, he pushed the door open and found deceased in a crouching position, face downwards, in the bath. On lifting him up he found a gash under the deceased's throat, and he resorted to artificial respiration, but life was extinct.

Dr. Unsworth, who was called in, said the wound was three inches long and one inch deep, and on the left-hand side of it there were two other smaller cuts. Witness had not the slightest doubt that the injuries were self-inflicted, but death was really due to drowning. In witness's opinion deceased had been in a kneeling position when he cut his throat, and then slipped face downwards in the bath through weakness.

A daughter of deceased said her father had often been depressed through failing eyesight, and had often told her of the sights he had seen at the Liverpool Eye and Ear Infirmary, whore he had gone with his own case.

A verdict of "Suicide whilst temporarily insane" was returned.

Juries do not however always accept the view of "temporary insanity."

In the City Court on April 11th, 1904, Mr. Francis Thomas held an inquest on the body of Henry Bell, aged 27, a general labourer, living at Bartholomew Close, E.C.

It appeared that the deceased, who was employed by Messrs. Black, engineers,

City Road, had recently undergone an operation, since which time he had been strange in his manner. On Wednesday the foreman went to speak to Bell, who was on the top floor of the building, standing by a crane door, one section of which was open. Bell stared at the foreman without speaking, and then deliberately jumped over the bar of the crane doorway into the street. He was conveyed to St. Bartholomew's Hospital, where he confessed that he had previously taken oxalic acid. Death occurred the following day, as the result of his injuries.

A verdict of suicide was recorded.

In the following case the jury were evidently influenced by the fact that he had not paid his rent, and so would not relieve the feelings of the survivors, petty spite might describe their action.

An inquest was held by Mr. Walter Schroder, at St. Pancras Coroner's Court, on the body of George William Carr, aged about 45. The evidence showed that the deceased, during the past nine months, lodged with Mrs. Griffiths, boarding-house keeper, 12, Ampthill Square, N.W., where he occupied a back parlour on the ground floor. He was, his landlady said, generally cheerful. Her belief was that he was a turf commission agent, and she was informed by a friend, a clergyman's son, who visited him and had since gone to New York, that Mr. Carr formerly owned a large estate in Leicestershire, which he had lost on the Turf. Latterly he appeared to be in want of money, and owed her a week's rent. On Thursday morning, owing to an escape of gas from his room, and her failure to evoke any response to her knocks and calls, Police-sergeant W. Walker was called in, and forcing the door open, he found the apartment filled with gas, and the deceased lying in his night attire on his back dead in bed. Tied to a gas burner turned on was a length of gutta-percha tubing, the other end of which, to the extent of an inch, was inserted in the deceased's mouth, where it was kept fixed by two pieces of string fastened at the back of his head.—Dr. J. Maughan, police divisional surgeon, who was fetched, ascribed death to suffocation consequent upon coal gas poisoning. Only 3*d.* was found in the deceased's possession. Among his effects enclosed in a piece of old faded paper was the photograph of a lady, at the back of which was written the word "Mother." The paper bore the words, evidently written some years ago: —"In case I should at any time meet with an accident, which is very likely, as my legs are never safe, I have a little freehold at St. Pancras Cemetery, where my mother, Ellen Carr, and John Borsley are buried.—George W. Carr."—The Coroner's Officer said he had failed to find any of the deceased's relatives or friends.—The jury returned a verdict of Suicide, adding that there was no evidence indicative of the state of the deceased's mind when he committed the act.

In the case of convicts or murderers (of the ordinary type) juries will rarely find any extenuating features. This fact is another illustration of the curious position referred to later (p. 882) in which we allow a jury to express an *opinion* on the mental condition of a person, which opinion then becomes a legal *fact*.

The case of Whitaker Wright, for example, a big company promoter who committed suicide by cyanide of potassium, on being condemned to penal servitude;

or the following on June 24th, 1904:—

An inquest was held concerning the death of Robert Bullen, who was sentenced on Tuesday to ten years' penal servitude for manslaughter, and committed suicide in a cell in Bodmin Prison. Evidence showed that deceased was found hanging from the cell ventilator by a piece of string which he had managed to hide in the mattress of his bed after the previous day's work. He had placed the table of the cell near the door, and having fixed the string to the ventilator and round his neck, must have quietly dropped off the table. When found, he was dead. The jury returned a verdict of *felo-de-se*, and attached no blame to any of the officials, every precaution having been taken. Several pieces of string were found in deceased's bed. These had been knotted together in order to make one piece.

Or the case of Crossman, who, early in 1904, cemented his seventh wife up in a box after murdering her.

In all these cases a verdict of *felo-de-se* was returned, probably justly, but still only on the principles (on p. 780, *supra*) enunciated, so far as evidence shows.

SUICIDE IN LIFE INSURANCE.

This presents two or three problems :—

1. A consideration of the sanity of the individual at the time when he admittedly commits suicide. (The policy here may be an ordinary or accidental one, either of them with a suicide clause.)

2. The question of whether a given admittedly violent death was due to accident, suicide, or homicide (this mostly in accident policies).

3. Bogus suicides, or even bogus deaths, which may be used for any fraudulent purpose.

Problem 1. Sane or Insane at the time of Suicide?—According to the rules of some insurance offices a policy of life-insurance is forfeited by the act of suicide, but not according to the rules of others.

[The editor is himself insured in the Rock Life, and the Accident Insurance Companies ; in his policies suicide is thus introduced :

> In the Rock policy.—The company agrees to pay the sum assured provided always that in case the assured . . . shall commit suicide . . . the policy shall be null and void.
>
> In the Accident Insurance policy.—Provided that this policy . . . does not apply to accidents, injuries, or death . . . by intentional self-injury, or by suicide, or by attempted suicide, whether felonious or otherwise. . . .

In the Ocean Accident and Guarantee Corporation policy it is thus introduced :

> This policy does not extend to the death or injury of the assured by suicide or attempted suicide, whether felonious or not, or caused by his intoxication or undue over-exertion, or while under the influence of drink or drugs or insanity or somnambulism. . . .]

Does the proviso in the policy respecting suicide include all acts of self-destruction, or is it restricted only to those cases in which either a sane or a partially insane person consciously destroys himself? The act of suicide does not necessarily indicate insanity ; but supposing self-destruction to have been really an act of insanity, it has been doubted whether the policy should be legally forfeited. In an equitable view the policy should not be forfeited under these circumstances, any more than if the party had died accidentally by his own hands. The condition reasonably implies that the assured puts himself to death *deliberately*, and not unconsciously through a delusion as the result of a fit of delirium or other attack of insanity. There is a form of suicide not unlikely to present itself for consideration—namely, where a man, in the habit of using a powerful drug for medicinal purposes, takes a large dose while in a state of intoxication and dies.

> In 1857, George Fife died from an overdose of morphine, and it was proved to the satisfaction of the jury that this must have been taken while he was intoxicated.

In such a case a man may have no sane intention of destroying himself, yet he dies by his own hands. As drunkenness does not excuse or justify any act of homicide, so it would not probably be allowed to affect the question of suicide; and death under such circumstances would probably be held to be a felonious killing (Stephen, "Hist. Crim. Law"). This question was raised in the case of *Borradaile* v. *Hunter* (1843), 12 L. J. C. P. 225.

An action was brought to recover the amount of a policy of insurance effected on the life of a clergyman who threw himself into the Thames from Vauxhall Bridge, and was drowned. The whole case turned upon the legal meaning of the words "*die by his own hands*," which formed the exception in the proviso to the payment of the policy. At the trial of the case, Erskine, J., directed the jury, that if the deceased threw himself into the river knowing that he should destroy himself and intending to do so, the policy would be void; they had further to consider whether the deceased was at the time capable of distinguishing between right and wrong, or, in other words, whether he had a sufficient knowledge of the consequences of the act to make him a *felo-de-se*. The jury found that the deceased threw himself into the water intending to destroy himself, and that previous to this act there was no evidence of insanity. They were then directed to take the *act itself* with the previous conduct of the deceased into consideration, and say whether they thought he was at the time capable of knowing right from wrong. They then found that he threw himself from the bridge with the intention of destroying himself, but that he was not then capable of judging between right and wrong. The jury were, as usual, evidently perplexed with the strict meaning of the words right and wrong: the first part of the verdict made the case one of *felo-de-se*, the last part made it one of insanity. The verdict was entered for the defendants—*i.e.* that the deceased was a *felo-de-se*, and that the policy was therefore void.

This case was subsequently argued before the four judges in the Common Pleas. It was then contended for the plaintiff, that according to the terms of the policy there must have been an *intention* by the assured to "die by his own hand," and that an insane person could have no controllable intention. The judges differed: three thought there was no ground for saying that the deceased was affected by an uncontrollable impulse; on the contrary, the jury found that he threw himself into the river knowing that he should destroy himself and intending to do so. In their opinion the act was one of *felo-de-se*, and the policy was void. Tindal, C.J., considered that the verdict should be for the plaintiff, thereby leading to the inference that the act of suicide was in this case the result of insanity, and not of a felonious killing, to which alone he considered the exception in the proviso should apply. It is probable if the term "*suicide*" had been inserted in the policy, instead of the words "*die by his own hands*," that the decision would have been in favour of the plaintiff; for to vitiate a policy from an accidental result depending on an attack of insanity, and *flowing directly from that attack*, is virtually vitiating it for the insanity itself. In this respect, it appears that the Chief Justice took a sound view of this question, so important to the interests of those who have insured their lives. It is impossible for a man to enter into a contract *against an attack of insanity*, any more than against an attack of apoplexy. The jury found that the deceased was irresponsible for the act, and it is clear that the insurers and assured intended no more by using the terms "die by his own hands," than the act of suicide. By this decision, therefore, the insurers received the benefit of a wider

interpretation of the terms than that which either party could have foreseen or contemplated.

The question was again raised in the case of *Schwabe* v. *Clift*, Liverpool Sum. Ass., 1845. The deceased, whose life was insured, destroyed himself by taking sulphuric acid; and there was clear evidence of his being at the time in a state of insanity. The jury here, under the direction of Cresswell, J., returned a verdict for the plaintiffs, thereby deciding that the policy was not vitiated by the mere act of *suicide* (*vide Clift* v. *Schwabe* (1847), 17 L. J. C. P. 21).

The judge held that to bring the case within the terms of the exception, the party taking his own life must have been at the time of the act *an accountable moral agent and able to distinguish right from wrong*. In this instance the term used in the policy was "suicide," which according to the learned judge meant "a *felonious* killing." Supposing that the assured was killed by voluntarily precipitating himself from a window while in a fit of delirium from fever, this would be an act of suicide or dying by his own hand; but it surely cannot be equitably contended that his heirs should lose the benefit of the insurance in consequence of an event depending on an accidental attack of a disease which no one could have foreseen, and against which no one could guard? If this principle be not admitted, the decision which must necessarily follow would appear to be against all justice; if it be admitted, then it must apply equally to every case of mental disorder, the proof of the existence resting with those who would benefit by the policy.

On appeal, the judgment in this case was reversed, the judges however differing. It was argued for the insurers, that if a man retained just enough of intelligence to produce death by competent means, but was deprived of all *moral sense*, the policy was void. Against this view it was urged by one of the judges, that whether the intellect was destroyed altogether or only partially, it could make no difference. If death was the result of disease, whether by affecting the senses or affecting the reason (thus leading to suicide), the insurance office was liable under the policy. If the act was not the act of a sane and reasonable creature, it was not an act of suicide within the meaning of the proviso. Those judges who adopted the opposite view held that the meaning of the words, as introduced into the exception, was—if the party should kill himself *intentionally:* the words were considered to include all cases of voluntary self-destruction. If a party voluntarily killed himself, it was of no consequence whether he was sane or not. The majority of the court held this view, and a new trial was granted. Had all the judges been present to give their opinions, the decision might have been different; for five had expressed themselves at various times in favour of the view that the term suicide in policies applies only to cases in which there is no evidence of insanity; while four had declared their opinion to be, that it includes all cases of "intentional" self-killing, whether the person be sane or insane. It is difficult to understand how a man in a fit of delirium or insanity can be said to kill himself voluntarily or intentionally. Will and intention imply the judgment of a sane man in regard to civil and criminal acts, but a delirious or really insane person acts under a delusion; and as the law would hold him irresponsible in regard to

others, his representatives should not suffer for an act which he was himself incapable of controlling (*Law Times*, 1846, p. 342).

The decision in this case is of great importance to persons whose lives are insured, for it may be made to govern others; and on this principle, a man attacked with delirium, and who, during the fit, precipitated himself from a window and was killed, would be declared a suicide within the meaning of the proviso, and a policy of insurance of his life would be *ipso facto* void. It will be perceived that the law, as interpreted by a majority of the judges, is that whenever a person destroys himself *intentionally*, whatever may be the state of his mind, the policy becomes void. It also appears that, according to this legal view of the question, a person may have and exercise such an intention although undoubtedly *insane*. Whether he has been found so under a Commission, or a verdict to this effect has been returned at an inquest, is therefore unimportant. It must be proved by those who would benefit by the policy, that the party had died from his own act, but without *intending* to destroy himself. If a man take poison, or shoot himself, or commit any other act leading to his own death, it must be shown that it was the result of *accident*, and not of design on his own part. Some insurance offices now insert in a contract a proviso by which, whether the person be found *felo-de-se* or not, the policy shall be forfeited: but they reserve to themselves the right of returning a part or the whole value of the policy, calculated up to the day of death. In the meantime they have the power of taking the full benefit arising from an act of suicide committed during a fit of delirium or insanity, in which, as medical men know, there can exist no controllable intention, no freedom of judgment, and no real exercise of will (see case *Prov. Med. Jour.*, 1848, p. 428).

From these cases one fact is clear—the act of suicide is not treated by the law as a necessary *proof of insanity*; and, therefore, the ingenious arguments which have been held on this subject have but little interest for a medical jurist in a practical point of view. It has been elsewhere stated that acts of suicide have been mistaken for homicide, merely because the deceased had expressed no *intention* of destroying himself, and had manifested to his friends no disposition to the act by previous conduct. This, however, is a fallacious view of the subject, since suicide from sudden impulse is by no means infrequent: and even when the act bears about it marks of deliberation, it is not to be expected that a person should previously announce his intention, for this would be a sure way of defeating his object.

If, as it is alleged, the act of suicide was in all cases the offspring of insanity, suicide should be frequent among the insane. Experience, however, is not in favour of this assumption. As mechanical restraint is either abolished or considerably diminished in most asylums, lunatics have now much more liberty than formerly, and yet suicides among them are comparatively rare. This favourable result must be in part ascribed to active superintendence and watching of those known to have suicidal tendencies.

The rule of law as settled by the above case would seem to be that whenever the assured destroys himself *intentionally*, whatever may be the state of his mind, the policy is void. If a person, whether sane or insane, kills himself *unintentionally*, then the insurers are liable; but

the onus of proof in this case lies upon the plaintiffs, *i.e.*, those who would benefit by the policy.

That there is still room for a final ruling is, however, proved by the following case, which in March, 1904, was decided in the King's Bench Division:—

"I will not commit suicide, whether sane or insane, during the period of one year from the date of said contract." This sentence constituted one of the clauses in an insurance policy made by the Mutual Life Insurance company of New York on the life of a Mr. Max Firnborg, and formed the basis of an action brought by Messrs. Ellinger & Co., of Oxford Street, Manchester, against the insurance company to recover 4,000*l*.

Plaintiffs' case was that in May, 1902, Mr. Firnberg was indebted to them for a considerable sum of money, and applied to the company for an insurance on his life for the purpose of covering the debt, and informed the company that the policy was being taken out in the plaintiffs' interest. In February of the following year, Mr. Firnberg, during a fit of insanity, committed suicide. Plaintiffs thereupon took action to recover the money, contending that the suicide clause was nothing more than a personal undertaking by Firnberg, for the breach of which they were not responsible.

Defendants submitted that the effect of the suicide clause was to relieve them of liability in the event of Firnberg taking his own life.

Mr. Justice Bigham was of opinion that the defendants were right in their contention and gave judgment accordingly, with costs, and the judgment was confirmed on appeal (November, 1904).

The wording of the clause is obviously extremely unfortunate, and one might say silly, on behalf of the assured, for it is obvious that if he became insane there could be no sort of guarantee that he would not commit suicide as the first act of his insanity.

This psychological problem seems to the editor to be one to which no final conclusion can ever be reached; it has been and will continue to be discussed *ad nauseam* in every work on mental diseases, and in every case in which litigation arises over suicide. The common sense practical solution seems to be in advising insurance companies and insurers to fix the clause *re* suicide in such a way that the policy is (*a*) void under any condition if life is terminated by suicide, or (*b*) *per contra* is payable under any condition of suicide. The latter is impossible according to an official of the Ocean Accident, &c., Co., and so presumably cases will continue on occasions to be fought on the question of "Sane or Insane?" The editor is, however, unable to find any case more to the point than the one above (see "Suicide whilst temporarily Insane—a Legal Contradiction," by R. H. Wellington, "Trans. Med. Leg. Soc.," vol. 1) He feels bound to admit that the "suicide clause" as drawn by the Ocean Company (*vide* above) would seem to be sufficiently stringent to prevent litigation as far as accident policies are concerned.

Problem 2. Was an admitted Violent Death Accidental, Suicidal, or Homicidal?—A person may die from poison, wounds, drowning, or other forms of asphyxia; and it may be difficult to say in certain cases whether the death arose from accident, suicide, or from violence inflicted by another. Such cases are often left in great uncertainty at the coroner's inquest—the evidence received being imperfect or insufficient; because in cases of sudden death, provided there be no suspicion of murder, it is considered of little moment to make a strict inquiry. The inquest jury's verdict, "accidental death,"

merely indicates the absence of a criminal cause of fatality. If the life of the deceased should happen to be insured under a policy containing this condition respecting suicide, the question may become of great importance to the interest of the insurers, and they will require clear evidence that the death was natural or accidental, and not suicidal, before paying the amount of the policy. The cause of death should in all cases of violence be determined by a medical man; this will put an end to any dispute concerning the payment of the policy, and relieve the representatives from the trouble and expense of litigation. If the death be sudden, and any suspicious circumstances are left unexplained, it is almost certain that a civil action at law will follow. Medical men are not therefore safe if, at a coroner's inquest, they suppose that they have only to satisfy a jury by a hasty opinion expressed from an external view of the body or an ill-conducted inspection, merely because it may appear to them quite certain that the deceased could not have been murdered. Should the deceased happen to be one of that class of persons on whose lives insurances are commonly effected, the whole of the circumstances connected with the examination of the body, and the medical opinion of the cause of death, must come to light, and if the autopsy have been carelessly performed, it will probably be made the subject of a severe cross-examination. There have been several painful exposures of this kind, because the medical witness thought any kind of evidence would serve the purpose of a coroner's jury. The verdict of a jury at an inquest is not binding on a company, it is regarded by them merely as an indication: they have not only a right, but often good reason, to dispute it, and they frequently exercise this privilege. The insurance companies are exposed to all kinds of fraud, actually leading, as in the case of burial clubs (a kind of life insurance), to the perpetration of murder for the sake of the small amount insured.

[In previous editions of this work will be found an extremely interesting account of a case illustrating the necessity of great care in the inspection of a body for a coroner's inquest. Inasmuch as the evidence actually obtained was totally inadequate to prove anything it is omitted from the present edition. The verdict turned upon medical evidence for or against narcotic suicidal poisoning as opposed to murder by violence.—Ed.]

It is often a matter of great difficulty to distinguish suicide from accident, but the distinction is absolutely necessary when a claim is made through the deceased for the payment of a policy of insurance. Tardieu relates some cases in illustration of the difficulties which surround these investigations.

While a carriage was being driven along the boulevards of Paris, a loud report of a gun was heard and smoke was seen issuing from the carriage-window. The carriage was stopped, and it was then seen that there was the body of a man in one corner in a sitting posture, with a double-barrelled gun between his legs. Death must have been almost instantaneous, as the left half of his skull, which had been blown off in the explosion, was found lying between his legs. It appeared that he had only been in the carriage five minutes, and that shortly before he had insured his life in two French offices for the sum of 6,000*l*. When the claim was made by the relatives, the offices refused to pay, on the ground that the death was a voluntary act (deliberate suicide) and not accidental. The case was fully investigated by Tardieu and Briere de Boismont, and they published a lengthy report of the facts

("Ann. d'Hyg.," 1860, 1, p. 443; 1859, 2, p. 126). The conclusion which Tardieu drew from an examination of the position of the body and of the gun, as well as from the oblique direction of the wound in the head, was that the piece had been voluntarily discharged, and death was the result of suicide, and not of any accident from the mode of carrying the gun. The act had been perpetrated in a deliberate manner, but there was nothing to show that the deceased had contemplated self-destruction.

As the offices repudiated the contract on the ground of suicide, it was for them to prove their case. This they failed to do, and the Tribunal condemned them to the payment of the full amount of the insurance ("Ann. d'Hyg.," 1866, 2, p. 397).

Briere de Boismont reports a case which is also instructive in reference to this difficult question. A man was found dead on the road, apparently strangled. His affairs were found to be in an unsatisfactory state, and it was supposed that he had destroyed himself; but the position of the body, and the condition in which it was found, were apparently not consistent with this theory. His hands were tied behind his back, and there were the appearances of a robbery. As all the circumstances pointed to a violent death at the hands of another, a judicial inquiry was made, which from want of evidence led to no result. The deceased, who was a merchant, had recently effected an insurance on his life for the amount of 1,600*l.*, which was to be paid to his family on his death, except in case of his committing suicide. This sum was paid into court, and was subsequently reclaimed by the office on the ground that the deceased had destroyed himself. A witness had come forward with an autograph letter of the deceased, in which he had described the motives that had led him to perpetrate the act, and the mode in which he intended to carry out his design. This document proved that he had sacrificed his own life for the sake of his family, in order to preserve them from impending ruin. According to the private letter to his friend, which had every appearance of authenticity, he had suspended himself to a beam, from which a friend, by a previous arrangement, had cut him down, and had then disposed his body on the high road, under such circumstances as to give the impression that he had been the victim of a murderous assault ("Ann. d'Hyg.," 1866, 2, p. 397).

So far as medical evidence can throw light on the problem, it has already been very fully discussed under the various forms of violent death, *q.v.*, and need not further be touched upon.

Problem 3. Bogus Suicides and Deaths.—The two following cases show that this form of fraud is practised, but the proof of fraud has commonly little to do with *medical* evidence:

A claim was made on an insurance company for the amount of a policy on the life of a man who suddenly disappeared, while at Brighton, within a week after an insurance had been effected on his life. The man's clothes were found on the beach, and the jury were asked to infer from this fact that the man was drowned while bathing, and that his body had been carried out to sea. No one had seen him go into the water. The jury were discharged without a verdict.

It was quite possible that the clothes had been designedly placed there, and that the man had gone off in another direction, and was then living. Such, indeed, the sequel to the case proved to be a fact, for a body, washed ashore some 100 miles away from Brighton, was identified as that of the assured. The insurance was paid, and it was only some time later that the fraud was discovered (*Trew* v. *Railway Pass. Ass. Co.* (1856), 5 H. & N. 211).

Sir Thomas Stevenson has since met with another very similar case:

In the autumn of 1878, a young merchant was staying at an hotel in Barmouth. One morning he went to bathe alone from the beach. His clothes, containing money, and his watch were subsequently found, but the body of the supposed drowned man was not found. An insurance on his life was paid. Six months

after, the supposed deceased was recognised and challenged in South America by a friend; and the insurance money had to be refunded. The missing man had been in pecuniary difficulties. He took with him to bathe an extra suit of clothes, and decamped, leaving money in the pockets of the clothes on shore in order to divert suspicion (*vide* "Identity").

It is not only in frauds on insurance companies that suicide is simulated—it has been used for severing the marriage tie.

The following case occurred in the Divorce Court in June, 1904, before Sir F. Jeune :—

Mrs. Jane Sykes Sanderson asked for the dissolution of her marriage, on the ground of the desertion and adultery of her husband, Mr. George Frederick Theodore Sanderson.

Mr. Barnard, on behalf of the petitioner, stated that the parties were married on August 8th, 1892, at St. Paul's Church, Bridlington. They afterwards lived together at Seacombe, Cheshire. The husband then obtained employment as manager of the Empire Theatre, Belfast. On July 11th, 1902, he said he was going to Blackhead, near Belfast, for the purpose of bathing. He did not return home, and an announcement was made that his clothes, boots, and hat had been found on the rocks. It was a peculiar fact, however, that, although he went away on his bicycle in the morning, the bicycle had never been found. The wife and two children never heard of him from that time down to 1903, when Mrs. Sanderson ascertained that her father-in-law had received a letter from her husband, dated April 13th, 1901, containing the following passages suggestive of suicide:

This is from your erring son, George, who has no excuse to make for himself. I fell in love more like a madman than any sane person. I gave up all for the girl I love. . . . I have been out of employment, but I earned 2*l.* a week for seven weeks, and we have at times been absolutely starving. . . . Good-bye, father. Ask God to forgive me.—The last from your son.

Inquiries were then made, and it was discovered that the respondent went away with a lady to Australia in the ss. *Medic* from Liverpool, under the name of "Mr. and Mrs. Trevelyan," and they had been living in Sydney as man and wife.

His lordship granted a decree nisi, with costs.

Occasionally a suicide is alleged where in fact a merciful overdose of a drug has been administered, upon the principle that dead men tell no lies—nor truths (*cf.* Pichegru in 1804, the Duc de Choiseul-Praslin in 1840, and possibly M. Henri in L'affaire Dreyfus).

SECTION XIII.

LUNACY.

Synopsis of the subject as discussed in the following pages :—

A. Lunacy in General.

1. The executive of the Acts of 1890 and 1891.
2. What is insanity? Attempts at a general definition.
 - (*a*) Medical.
 - (*b*) Legal.
3. Some points in the diagnosis of early cases.
4. Classification of well-marked cases.
 - (*a*) By Clouston and Mercier.
 - (*b*) By Royal College of Physicians.
 - (*c*) By Dr. Lloyd Andriezen.

 The classes themselves with brief comments.

 As given by Clouston and Mercier.
 - (*a*) Idiocy and imbecility.
 - (*b*) Dementia.
 - (*c*) Stupor.
 - (*d*) Depression.
 - (*e*) Exaltation and excitement.
 - (*f*) Systematised delusions.
 - (*g*) Moral and impulsive insanity.
 - (*h*) General paralysis of the insane.

 Retained from previous editions.
 - (*i*) Erotomania.
 - (*j*) Kleptomania.
 - (*k*) Pyromania.
 - (*l*) Somnambulism.
 - (*m*) Deaf-mutism.
5. Lucid intervals and recovery.
6. Heredity in, and causes of, insanity.

B. Lunacy in Relation with the Law.

1. Capability as a witness.
2. Should this person be placed under restraint?
 The Act of 1890 on the subject of uncertified patients.
3. How can he be placed under restraint? Act of 1890 and 1891.
 - (*a*) Reception orders of various kinds.
 - (*b*) Medical certification.
 - (*c*) *De lunatico inquirendo.*
4. Escape and discharge of certificated patients.

B. Lunacy in Relation with the Law—*contd.*

5. Responsibilities of the insane.
 - (*a*) Marriage.
 - (*b*) Civil contracts.
 - (*c*) Testamentary capacity.
 - (*d*) Criminal responsibility.
6. Alcoholism and lunacy.
 - Diagnosis of drunkenness.
 - Intoxication other than alcoholic.
 - Medical views on alcoholism.
 - Legal views.
 - Civil responsibility in alcoholism.
 - Criminal " " "
 - Restraint of Drunkards Act of 1898.
7. Feigned insanity.
8. Feigned deaf-mutism.

1. THE EXECUTIVE IN LUNACY.

The Lunacy Acts, 1890 and 1891 (53 Vict. c. 5; 54 & 55 Vict. c. 65), are the statutes which deal with the detention and care of lunatics and their property; and the Idiots Act, 1886 (49 & 50 Vict. c. 25), similarly deals with the care, education, and training of idiots and imbeciles.

The executive whose business it is to see that these statutes are carried into effect consists of the following personages :—

The Lord Chancellor (associated with other judges).

Five Chancery Visitors { Two Masters in Lunacy (barristers); Three additional Chancery Visitors (two medical men, one barrister) } = a Board of Lunacy.

Eleven Commissioners in Lunacy.

and as subsidiary officers :—

All "judicial authorities," *vide* p. 836.

All medical men duly registered.

The Lord Chancellor, as judge in lunacy, is entrusted with the care and commitment of the custody of the person and estates of lunatics. He acts either alone or jointly with any one or more of the judges of the Supreme Court. The judge in lunacy may make orders for the custody of lunatics so found by inquisition and the management of their estates. Under the control of the judge in lunacy are two masters in lunacy, who must be barristers of not less than ten years' standing. They have to deal with those persons who are found to be lunatic by a commission of inquiry, commonly termed chancery lunatics. The term "commission of inquiry" is now substituted for the term "commission in lunacy," a term which was apt to be confounded with that of commissioners in lunacy. Acting under the masters in lunacy are three additional *chancery visitors* (so that there are five chancery visitors), two medical men, and one a barrister of five years' standing. The three chancery visitors and the two masters in lunacy form a board.

The *commissioners in lunacy* regulate the affairs of asylums, and supervise such lunatics as are not found to be so by a commission of

inquiry. They are eleven in number, five of whom, including the permanent chairman, are unpaid; the remainder, three barristers and three physicians, are paid. Public lunatics—*i.e.* criminal and pauper lunatics—are kept, the former in Broadmoor Criminal Lunatic Asylum, and the latter in county and borough asylums—asylums which every local authority is bound to provide and maintain for the accommodation of pauper lunatics. The local authority may provide asylum accommodation for pauper and private patients, together or in separate asylums, and may provide separate asylums for idiots. A pauper lunatic cannot be allowed to remain in a workhouse as a lunatic unless the medical officer of the workhouse certifies that he is a proper person to be allowed to remain in a workhouse as a lunatic, and that the accommodation of the workhouse is sufficient for his proper care and treatment. Private lunatics—*i.e.* lunatics other than those found lunatic by inquisition, pauper lunatics, and criminal lunatics—may be detained in registered hospitals, licensed houses, county and borough asylums, or in houses as single patients; but the commissioners may sanction the reception of more than one lunatic in a house under special circumstances, and for the interest of a single patient.

2. WHAT IS INSANITY?

The terms insanity, lunacy, unsoundness of mind, mental derangement, mental disorder, madness, and mental alienation or aberration, have been indifferently applied to those states of disordered mind in which a person loses the power of regulating his actions and conduct according to the ordinary rules of that society to which by birth and education he belongs (Savage). In all cases of real insanity, the intellect is more or less affected—hence the term *intellectual insanity*. In a medical sense this implies a deviation of the mental faculties from an assumed normal or healthy standard. In an insane person there may be no bodily disease, but his language and habits are changed—the reasoning power which he may have enjoyed in common with others is lost or perverted, and he is no longer fitted to discharge those duties which his social position demands. Further, from perversion of reason, he may show a disposition to commit acts which may endanger his own life or property, or the lives or property of those around him. It is at this point that the law interferes for his own protection, and for that of society.

Many attempts have been made by psychologists to define insanity; but the definitions hitherto given are so imperfect that it would be difficult to find one which includes all who are insane, and excludes all who are sane. This difficulty is fully accounted for by the fact that mental disorder varies in its degree as well as in its characters; and the shades of disordered intellect in the early stages are so blended as to be scarcely distinguishable from a state of sanity. It is this twilight condition of the mind, when it is fluctuating between sanity and insanity, which no definition can comprise, especially as the mind differs in its powers and manifestations in most persons, and it is therefore difficult to fix upon a standard by which a fair comparison can be made. The vulgar notion of insanity is that it consists in an entire deprivation of reason and consciousness; but the slightest acquaintance with the

monomania. In idiots and imbeciles ideas worthy of the name are wanting, and the power of thought is absent or deficient; in maniacs and monomaniacs the ideas flow freely, but they are perverted, and the power of thought is irregular and uncontrolled. In idiocy and imbecility we do not meet with the hallucinations and illusions which constitute the main features of mania and monomania. Idiocy is much more likely to be confounded with dementia, and indeed when dementia is confirmed and complete (*fatuity*), there is no appreciable difference, for in neither state is there any evidence of the exercise of mental power. In idiocy no ideas have ever been formed; in imbecility they have been partially formed, but arrested; in dementia they have been more or less completely formed, but have subsequently become entirely obliterated. It is important to remember that in idiocy and imbecility there is no gradual loss or impairment of faculties, as is generally observed in dementia; the person is what he always has been—mentally weak and unsusceptible of any great degree of improvement by instruction.

From these remarks it will be perceived that imbecility is a state existing from birth or from childhood; it may supervene from disease after birth, in a child in whom there was no reason to suspect its existence, although it is more common to find the deficiency congenital. The term is often applied to express that weakness of the mental powers which takes place in the aged at the close of life, even when the mind has been well developed in maturity. Thus we speak of the imbecility of age: this is truly nothing more than a state of *senile dementia*, and to apply to it the term "imbecility" tends to create confusion.

It is exceedingly important to bear in mind that imbeciles frequently, and idiots less commonly, are subject to the usual animal passions of anger, and possibly fear, and that in outbursts of anger they may perform actions which bring them into conflict with the law; stealing and setting fire to objects are perhaps commoner forms of this trouble than actual violent assaults on the person.

(*b*). Dementia.

This is a state which, although sometimes confounded with mania, is very different in its characters. Dementia, when confirmed, consists in a total absence of all reasoning power, and an incapacity to perceive the true relations of things; the language is incoherent, and the actions are inconsistent; the patient speaks without being conscious of the meaning of what he is saying; memory is lost, and sometimes the same words or phrase is repeated for many hours together; and words are no longer connected in meaning, as they are in mania and monomania. This state, often called *fatuity*, is a not unfrequent consequence of mania or monomania.

Dementia varies in degree. The disordered mind of aged persons is one form of dementia; here we find memory and some mental power, although the memory is restricted to objects long since past, and the exertions of the mind are only momentary. Such persons in dementia are quiet, others are in constant motion as if in search of something. There is generally a strong disposition manifested to collect all kinds

of useless articles, which are hoarded up as if they were of great value. In some instances this disease comes on gradually—the faculties, both normal and intellectual, decay one by one; while in other instances, although much more rarely, dementia may occur suddenly from a violent shock or impression on the mind.

This was the case with the young lady referred to by Travers, who suddenly fell into dementia from finding in her bed a skeleton, which had been placed there by some person to frighten her; in the morning she was found playing with the fingers of the skeleton, and all reasoning power was extinct. The following instance of dementia occurring suddenly from violent emotions is related by Mare: "During the Reign of Terror in France, an artilleryman proposed to the Council of Public Safety a new species of cannon which was to have the mostly deadly effects in war. A day was appointed for the trial of this invention at Meudon, and Robespierre wrote a letter to the inventor, thanking him for his discovery in such flattering language, that the poor man became motionless on reading it. His mind was gone, and he was conveyed to a lunatic asylum in a state of confirmed dementia" ("De la Folie," vol. 1, p. 269). There is something fearful in the thought that the powers of the mind, which it may have taken many years to build up, may be thus destroyed in a moment by strong emotion.

Dementia may be acute or chronic, primary or secondary. The countenance of the patient is generally pale, vacant, and without expression, the look vague and uncertain, and tears are abundantly shed from the slightest causes.

The following may be taken as the most striking differences between mania and dementia. In mania there is an incoherence of ideas, but depending on too great rapidity of thought and excitement of the intellectual powers; in dementia there is a want of ideas, and the incoherence depends on the loss of the power of connecting them, owing to defect of memory; volition is lost, and the brain seems in a state of collapse (Esquirol, "Malad. Ment.," vol. 2, pp. 224 and 232). In fact, in dementia there is a more or less complete abolition of the moral, intellectual and voluntary powers; in mania, and also in monomania, they are in a state of perversion. Dementia is often a consequence of these states, and sometimes alternates with them.

Of primary dementia of chronic type the senile form is the most common, due to cortical degeneration progressive and incurable.

Secondary dementia is the condition of mental weakness into which so many acute cases subside—they form the bulk of insane patients detained in asylums.

(*c*). Stupor.

Of this condition Savage ("Allbutt's System," *loc. cit.*) says "It is a name used to indicate those mental disorders which serve as links between dementia and melancholia; it must be looked upon as a defective power of reaction, depending upon suspension rather than on absolute want of power."

Savage further states, "The danger of suicide is not great, but impulsive acts may occur."

As such cases are therefore not likely to come into violent conflict with the law for crimes, and as in their civil aspects they are easy of recognition as "unsound," nothing further need be said about them.

(*d*). Depression.

For a full description *vide* Rayner (Allbutt, vol. 8, pp. 361 *et seq.*), but Dr. Taylor's old description may well stand here. He stated: "Monomania frequently assumes one of two forms; either the thoughts are lively and gay, or they are oppressed with gloomy melancholy. In the first state, the persons will fancy themselves to be kings and queens, and overflowing with wealth, which they are prepared to distribute with regal profusion; in the second state we find silence, seclusion, and the most heart-rending sorrow. The latter condition, by no means uncommon as a form of monomania, is called *melancholia* (mania with depression), or *lypemania* (λύπε, *sorrow*). Those who are affected with it suppose that they have committed some unpardonable sin, and pass their hours in silence with eyes fixed on vacancy, and in the most gloomy forebodings of temporal and eternal punishment. They do not sleep, and will sometimes neither eat, speak, nor move; force must be used to make them take food and exercise. In some instances no persuasion can conquer their silence; one patient thus affected was not heard to utter a word during four years. If spoken to, they shed tears and violently repulse the person who addresses them.

"Melancholia frequently leads to an act of suicide or murder, and persons affected with it require very close watching. In the lighter forms of the disease there is no sign of mental aberration, and the patient will go through his usual routine of duty, but always with the same desponding air—so that his occupation seems scarcely to distract his thoughts from the delusion for a single instant. In other cases the delusion is so well concealed that no suspicion exists, until an act of suicide leads to inquiry, and some evidence of strangeness of conduct is then for the first time forthcoming. There is either an entire absence of motive for the act, or the motive is based on a delusion."

Rayner (*loc. cit.*) states that fifty-six per cent. of melancholics in asylums are suicidally inclined; he says the suicidal impulse must be suspected in every case; the desire may be cunningly hidden or openly avowed.

(*e*). Exaltation and Excitement.

In this form of insanity, to which the word "mania" used to be applied, there is a general derangement or perversion of the mental faculties, accompanied by greater or less excitement, sometimes amounting to violent fury. Ideas flow through the mind without order or connection, the person losing all control over his thoughts, and believing and acting upon them, however absurd and inconsistent they may be. Rapidity of utterance and incessant agitation accompany this state; there is also great irritability, so that not the least contradiction can be borne. Mania may take place suddenly, as after a violent moral shock, but in general it comes on slowly. It may be chronic or acute, recurrent or continued. There are very few cases which do not present remissions, more or less complete; and in some instances, after a violent attack, the reason appears to be perfectly restored, forming then what is termed a lucid interval, the clear

distinction of which, in a legal point of view, is of material importance.

There is a popular notion that violent fury is met with in all cases of mania, but this is an error. In some instances this symptom is wanting. These persons are seldom excited to any acts of violence, and should they give way to passion they are easily subdued by the slightest menace.

In the greater number of cases of mania there is excitement, coming on in paroxysms without any obvious cause, and leading the patients to acts of violence either towards themselves or others. These are the instances which chiefly require close personal restraint; this, however, has a tendency to increase the severity of the attack, and a more simple plan of treatment, *i.e.*, of watching by personal attendants, has been generally adopted. The attacks sometimes come on in a sudden and unexpected manner. On the occasion of a visit which the author made to an asylum, a female patient who had been for some time remarkably quiet in her manner, and was considered so far convalescent as to be about to leave the place, seized a living rabbit and tore it to pieces, limb from limb. Her mania had suddenly returned, and it was necessary to place her again in confinement.

In visiting a person said to be affected with mania, for the purpose of examination, a medical practitioner cannot be too cautious. The fire-irons and all other articles which may be used as weapons of offence should be removed. Armstrong was accustomed to relate that on one occasion in examining a patient he narrowly escaped with his life.

In mania the patient sleeps but little, and sleep is disturbed by painful dreams. There is sometimes more maniacal excitement by night than by day.

It has been remarked that in mania there is great insensibility to cold and heat. Some persons affected with this form of insanity have lost their sensibility to such a degree that they will, if permitted, lie without any covering on a cold stone floor in the midst of winter, or they will handle red-hot coals without any expression of pain. This blunted sensibility is not, however, universal, and we must be careful not to draw from it the inference which has been erroneously drawn on some occasions, in which the death of lunatics in asylums has been a subject of judicial inquiry—namely, that these persons are less susceptible than sane people to the injurious effects of cold. Their bodily susceptibility is probably just as great, while they want that warning power which a proper sense of feeling gives to a sane person. The death of a lunatic of the name of Dolley, at the Surrey Asylum, in 1856, was ascribed to the effects of a cold shower-bath, continued for an unusual period.

The comparative insensibility of the insane to severe injuries may give rise to medico-legal questions.

In *Reg.* v. *Slater* and *Vivian* for manslaughter (C. C. C., September, 1860), the evidence for the prosecution showed that the deceased, a lunatic, suffering from incipient general paralysis, died rather suddenly three days after a serious struggle with one of his attendants. There were a few slight marks of bruises on the right side of the neck and face, and there was a bruise on the abdomen. On inspection, six ribs were found fractured on the right side, and five on the left. The fractures

were at a short distance from the cartilage, and were unattended with any displacement. There were lacerations of the left lobe of the liver, two inches in length, and a quantity of partially coagulated blood was effused in the cavity of the abdomen. These injuries were undoubtedly the cause of death, but when and how were they inflicted?

There was no evidence that the deceased had been subjected to any violence except in the struggle with his attendant *three days* before his death. As this was a life-and-death struggle, and great violence must have been used on both sides, it was considered that the cause of the injuries was sufficiently explained, and that death might have arisen from the violence inflicted by the attendant in endeavouring to escape from the attack of the lunatic. At a subsequent period, two of the lunatics confined in the same ward stated that deceased had been maltreated by the two prisoners shortly before death; that they had thrown him upon the ground, pounded his body with their fists, stamped on him with both feet, and then dragged him along the floor. Luke, Partridge, and Holt gave evidence of opinion to the effect that the injuries found on the body could have been inflicted only a short time before death, and that although lunatics might show an indifference to pain, yet it was impossible for such injuries as these to have been inflicted three days before death without the deceased exhibiting marked symptoms. The fact of so many ribs being broken would have materially affected respiration: his breathing would have been difficult, and would have attracted observation. As no symptoms were observed, they believed that the injuries which were the cause of death had been inflicted not more than two hours before the man died. Tyerman and Tucker, medical officers of the asylum, considered that the injuries might have been inflicted on the deceased in the violent struggle with the attendant three days before his death, and that he might not have exhibited any symptoms of suffering from the injuries during the interval. It was a case of insanity attended with paralysis, and this might have rendered the deceased insensible to pain. The jury acquitted the prisoners (*Med. Critic and Psych. Jour.*, January, 1861, p. 91). The power to sustain injuries, and to perform acts of volition and locomotion inconsistent with ordinary surgical (pp. 444 *et seq.*) experience, has been elsewhere noticed. An insane person may not only have this power, like others, but his disorder may diminish his sensibility to the effects of violence.

Persons suffering from mania are able to sustain the privation of food for a great length of time without any apparent injury to health. In some instances, owing to a suspicion that the food is poisoned, they decline to take any; and it is then necessary to feed them by the stomach-pump. This delusion respecting the poisoning of food is very common in the early stages of mania.

Usually, when the report of a remarkable case of poisoning has excited public attention, analysts are consulted by persons in reference to the alleged poisoning of their food. Wine, bread, milk, and other articles are brought for analysis; but although the results prove the absence of poison, it is often not possible to persuade the patients that poison is not present. The delusion may be sometimes traced to a peculiar taste in the article of food; at others it has only its usual taste, and the suspicion of poison is based entirely on a delusion. In nearly all cases of this description some person is indicated as the poisoner, and small circumstances in reference to the conduct of this person are magnified into proofs of guilt. In one

case some flour which had been used for dressing oysters was brought by a medical man for analysis: he felt confident, from the symptoms which he suffered, that the substance was strychnine, and that his wife had put it over the oysters in order to poison him. He said that he took the opportunity of her leaving the room to collect a little of the supposed poison, which he brought very carefully sealed in a paper, with a written statement of the symptoms which followed, among which some of the symptoms of strychnine had been very well described. On another occasion this gentleman brought for analysis a pair of stockings, on which he said his wife had rubbed extract of belladonna in order to make away with him secretly. The stains on the stockings were large iron-moulds, but he said he perceived in them the smell of belladonna, and after he had worn them his pupils became dilated, and he had dryness in the throat, with trembling and convulsions of the limbs. He probably took the account of these symptoms from a book on poisons. A solicitor retired from practice brought a copper tea-kettle, which he said was lined with crystallised arsenic, which had been used for poisoning his sister eight years before; he had kept it privately since that date, and was very desirous of having his suspicions confirmed by a chemical analysis. It proved to be nothing more than the common fur of tea-kettles: there was no arsenic. The whole was a delusion, for the circumstances under which his sister had died left no doubt that her death was owing to natural causes. A continual brooding over his lost relative, and a want of mental and bodily occupation, had led to an attack of insanity.

It is necessary that a medical jurist should be able to distinguish a case of *mania* from one of delirium depending on bodily disease. *Delirium* closely resembles the acute form of mania—so closely that mistakes have occurred, and persons labouring under it have been improperly ordered into confinement as lunatics. The following are perhaps the best diagnostic differences:—A disordered state of the mind is the first symptom remarked in mania; while delirium is a result of, and follows therefore upon, an attack of disease. Delirium being a mere symptom attendant on the disease which produces it, exists so long as that disease and no longer; while mania, depending on widely different causes, is persistent. Delirium disappears suddenly, leaving the mind clear; while mania commonly experiences only remissions. In delirium there is generally great acuteness of the senses. Inflammation of the brain or its membranes is distinguished from acute mania by the mode of its attack, the presence of severe pain in the head, and excessive sensibility with intolerance of light and sound. The clinical thermometer will also assist in the diagnosis; in a mental affection pure and simple the temperature is commonly normal, whereas in disease there is equally likely to be a marked deviation from normal, either upwards or downwards.

(*f*). Systematised Delusions.

This form of insanity is now termed paranoia. It is almost the equivalent of the old term monomania, or to what lawyers term "partial insanity," because in ordinary cases of delusional insanity there is a relative integrity of some of the faculties of perception, reproduction, and memory, and even on many (one might say most, —unconnected with his particular delusions) points a retention of considerable powers of judgment.

Conolly Norman (Allbutt, *loc. cit.*) defines it "as that mode of mental unsoundness which is specially characterised by delusion, that is by beliefs not common to the race, which arise from the uncorrected action of the imagination, and are not immediately connected with a

predominant emotional state (stupor, depression, or exaltation.—Ed.): the fixity of the morbid idea, and its usually slow development, form the characteristic note of paranoia."

There is no doubt that those who are affected with monomania in an early stage are frequently able to direct their minds with reason and propriety to the performance of their social duties, so long as these do not involve any of the subjects of their delusions. Their power of controlling their thoughts and feelings, and of concealing their delusions, implies a certain consciousness of their condition not usually met with in mania; and it also appears to imply such a power of self-control over their conduct as to render them equally responsible with a sane person for many of their acts. In a case of confirmed monomania, however, it is not to be supposed that a man is insane upon *one* point only, and sane upon all other subjects. The only admissible view of this disorder is that which was taken by Lord Lyndhurst in one of his judgments. "In monomania the mind is unsound; not unsound in one point only, and sound in all other respects, but this unsoundness manifests itself principally with reference to some particular object or person. There is no doubt that all the mental faculties are more or less affected, but the affection is more strikingly manifested in some than in others."

Monomaniacs frequently reason with correctness from false premises. A man fancying himself to be made of butter, will avoid going into the sun or sitting near a fire; another, who fancied himself to be made of glass, would allow no one to approach or touch him lest he should be broken. A common delusion relates to the presence of poison in food; this leads to abstinence from all kinds of food, or from food prepared by a particular person. When these harmless and absurd delusions exist, they require no interference unless they betray the person into acts of violence which are likely to injure himself or others. The mind may be generally unsound, but if the conduct of the person in the ordinary affairs of life is not irrational, there is no reasonable ground for interfering with his liberty of action. Haslam mentions the case of a well-educated architect, who thought that while he was asleep ideas leading to splendid discoveries were stolen from his brain by sprites creeping into his ears. To prevent this continual robbery of his intellect, he stuffed his ears with cotton wool, put on a flannel night-cap, and slept with his head in a tin saucepan.

In the first stage of monomania the judgment may be strong, and the mind apparently sound upon every point except the particular subject of delusion, and even, in some instances, there may be such a control over this delusion, that it would be difficult to discover whether or not there was any just ground for imputing mental unsoundness; but in a more advanced form of the disease, the delusion, whatever it may be, whether relating to wealth, ambition, religion, or politics, so overpowers the patient that he loses all self-control. His character is changed, and his habits are such as to render him unfit for social intercourse; he becomes incoherent; his ideas are perverted on all subjects, and he gradually lapses into mania or dementia. The last condition happens when the monomania is of long standing. Monomania may be remittent or intermittent, and it is sometimes accompanied with lucid intervals. Its progress is rapid, and its termination often unexpected; in some

instances the disease ceases suddenly without any previous warning, owing to the effects of a strong moral shock or impression.

Monomania, in its early stage, is liable to be confounded with *eccentricity:* but there is this difference between them. In monomania there is obviously a change of character—the person is different from what he was: in eccentricity such a difference is not remarked; he is, and always has been, singular in his ideas and actions; there is no observable change of character. An eccentric man may be convinced that what he is doing is absurd and contrary to the general rules of society, but he professes to set these rules at defiance; a true monomaniac cannot be convinced of his error, and he thinks that his acts are consistent with reason and the general conduct of mankind. In eccentricity there is the will to do or not to do: in real monomania the controlling power of the will appears to be lost. Eccentric habits suddenly acquired are, however, presumptive of insanity. It will be seen hereafter that the distinction of these states is of considerable importance in relation to the testamentary capacity of persons.

(*g*). Moral and Impulsive Insanity.

Of the former of these two forms, viz., **moral insanity,** although admitted by Savage, the editor is unable to find a collected and connected account, moral perversion being a feature scattered through the descriptions of all "unsoundnesses" of mind; he therefore leaves Dr. Taylor's description of, and remarks upon, it untouched, for his concluding remarks seem to be specially applicable to the modern tendency to excuse so many criminals on the score of irresponsibility. He said: "In addition to that form of insanity in which the mind is affected, known as *intellectual insanity*, Prichard and other medico-legal writers have described a state which they call *moral insanity* (*Mania sine delirio*), which is manifested simply by a perverted or disordered state of the feelings, passions, and emotions, irrespective of any apparent intellectual aberration. There are no hallucinations or illusions, and there is no evidence of delusion, but simply a perversion of the moral sentiments. Thus it is alleged that this form of insanity may appear in the shape of a causeless suspicion, jealousy, or hatred of others, especially of those to whom the affected person ought to be attached; and it may also manifest itself under the form of a wild, reckless, and cruel disposition towards mankind in general. It does not seem probable, however, that moral insanity, as thus defined, ever exists or can exist in any person without greater or less disturbance of the intellectual faculties. The mental powers are rarely disordered without the moral feelings partaking of this disorder: and, conversely, it is not to be expected that the moral feelings should become to any extent perverted without the intellect being affected, for perversion of moral feeling is generally observed to be one of the early symptoms of disordered reason. The intellectual disturbance may be sometimes difficult of detection, but in every case of true insanity it is more or less present, and it would be a dangerous practice to pronounce a person insane when some evidence of its existence was not forthcoming. The law does not recognise moral insanity as an independent state; hence, however perverted the affections, moral

feelings, or sentiments may be, a medical jurist must always look for some indications of disturbed reason. Medically speaking, there are, according to Prichard, two forms of insanity, moral and intellectual; but in law there is only one—that which affects the *mind*. Moral insanity is not admitted as a bar to responsibility for civil or criminal acts, except in so far as it may be accompanied by *intellectual* disturbance. Mayo denied its existence, and contended that no abnormal state of mind should confer irresponsibility, unless it involved intellectual as well as moral perversion ("Med. Test.," p. 69). Brodie also considered that there were no reasonable grounds for admitting this to be an independent form of insanity. There has been, as he suggests, much mystification on the subject. The term has been applied to cases to which the name of insanity ought not to have been applied at all—*i.e.* to "moral depravity," and also to cases in which delusions (false opinions as to existing facts) have really existed, and which might therefore have been more properly classed with cases of ordinary mental aberration ("Psych. Inquiries," p. 99). Of one fact we may be well assured: if in these cases of alleged *moral* insanity there is no indication of a perversion of intellect, *medical* evidence is not required to determine the degree of responsibility in reference to these persons. Those who administer the law, and any man endowed with common sense, will be as well qualified as a medical expert to decide this question. Further, until medical men can produce a clear and well-defined distinction between moral depravity and moral insanity, such a doctrine, employed as it has been for the exculpation of persons charged with crime, should be rejected as inadmissible."

Impulsive insanity would seem really to belong, strictly speaking, to epilepsy and the mental unsoundness arising from it. Jones ("Allbutt's System," p. 336) says, "Roughly speaking the epileptic insane are of two classes, viz., the simple or weak-minded, who are generally advanced in years and infirm; and the non-confirmed but mostly chronic, among whom are some of the most impulsive, dangerous and homicidal inmates of asylums. The former number about 20 per cent., the latter about 80 per cent. of the epileptic insane; of these 20 per cent. are of the 'very' dangerous."

The actual term "impulsive insanity" finds no place amongst the labels for classes of insanity, but every writer on the subject states that the insane are as a class liable to impulses of such force as to amount to "irresistible."

There may or may not be evidence of *intellectual* aberration, but the main feature of the disorder is the existence of a destructive impulse which, like a delusion, *cannot* be controlled by the patient. This impulse, thus dominating over all other feelings, leads a person to destroy those to whom he is most fondly attached, or any one who may be involved in his delusion. Sometimes the impulse is long felt, but concealed and restrained: there may be merely signs of depression and melancholy, low spirits and loss of appetite, as well as eccentric or wayward habits, but nothing to lead to a suspicion of the fearful contention which may be going on within the mind. As in suicidal mania, many of those who are in habits of daily intercourse with the patients have been first astounded by the act of murder, and then only for the

first time led to conjecture that certain peculiarities of language or conduct, scarcely noticed at the time, must have been symptoms of insanity. Occasionally the act of murder is perpetrated with great deliberation, and apparently with all the marks of sanity. These cases are rendered difficult by the fact that there may be no distinct proof of the existence, past or present, of any disorder of the mind, so that the chief evidence of mental disorder is the *act* itself (*mania transitoria*); of the existence of insanity, in the common or legal acceptation of the term, before and after the perpetration of the crime, there may be either no evidence whatever, or it may be so slight as not to amount to proof.

A sudden restoration to reason is not infrequent in such cases of homicidal mania.

For the alleged causes (vicious education, religious fervour, exhaustion, menstrual disorders, the puerperium—puerperal mania is a common form of it) the reader is referred to works on insanity (Cliff. Allbutt, vol. 8, etc., article by G. H. Savage).

It may make its appearance at all ages, even in children. It is occasionally periodical, and the paroxysm of insanity is preceded by symptoms of general excitement. The patient experiences colicky pains, a sense of heat in the abdomen or chest, headache, restlessness, loss of appetite, and lowness of spirits; the face is flushed or pale, the pulse hard and full, and the whole body in a state of convulsive trembling. An act of violence is committed without warning, and the patient appears as if relieved from some oppressive feeling. He may be calm, and express neither regret, remorse, nor fear; he may coolly contemplate his victim, confess the deed, and at once surrender himself to justice. In some rare instances he may conceal himself, hide the weapon, and, like a sane criminal, endeavour to obliterate all traces of the crime, thus showing a perfect consciousness of the illegality or wrongfulness of the act, and a desire to evade discovery. These are the main features of crime, and unless there is independent evidence of mental disorder, or of some bodily disease affecting the brain, the conclusion should be that the person is sane and responsible. The great problem to be solved on these occasions is—What are the plain practical distinctions between defective reasoning power and perverted moral sense? The latter condition alone should not exculpate a person or absolve him from the usual punishment; or persons undeniably sane, who have committed crimes, should be equally exculpated and absolved from punishment.

The case of *Reg.* v. *Wilson* (Lincoln Sum. Ass., 1864), referred to by Stephen, J., will furnish an illustration of this form of lunacy.

A woman consulted a medical man as to pains in her head, loss of appetite, and low spirits after her delivery; she was also suffering from religious despondency. While in this state she got up in the night and drowned four of her children in a cistern. She gave this account of the act: she washed the children, put them to bed, and retired herself about ten o'clock, but could not sleep; and between twelve and one o'clock it was suggested to her mind, as she says, by a black shadowy figure, that if they were in heaven they would be out of danger and better done to than she could do for them. It was still further suggested to her mind, in the same way, that she could easily put them into the cistern, and she at once proceeded to do so; it was better for them to die young than to grow up wicked

(See Stephen's "Crim. Law of Eng.," p. 91.) The case of Mrs. Brough, who murdered six of her children, was somewhat similar in details. This woman stated that while thinking of her children, during the night, a black cloud came over her which seemed to surround her, and she felt compelled to kill them.

In other instances, those who have perpetrated such a series of murders have stated that they had had the same sensation of darkness or a black spectre brooding over them just before the perpetration of the act.

Such cases are only too frequently reported in the daily papers. At a meeting of the Med. Psycholog. Soc. in 1901 (*vide Lancet*, 1, 1901, p. 706) several well marked cases were reported.

(*h*). General Paralysis of the Insane.

This disease differs at present (the morbid anatomy of mental diseases is being carefully studied by numerous observers) from all other forms of mental affection in that we have an almost certain knowledge of its precise etiology (viz., syphilis), and a very complete picture of its morbid anatomy.

For a complete account the reader is referred to works on mental disease (Savage's "Insanity," *e.g.*); the following is a brief epitome of the trouble.

Its morbid anatomy (Mott, *B. M. J.*, 1899, vol. 2) consists of a fine sclerosis of the cortex cerebri, with thickening of the pia mater and adhesion between the two, which is exactly comparable to that between the capsule and cortex of a granular kidney. This renders easy of comprehension the division of cases of general paralysis of the insane into the two well-recognised, and often exceedingly well-marked, types :

1. The physical group, where the principal symptoms are of a (muscular) paralytic type. Rolandic region earlier and more markedly affected.

2. The mental group, in which the principal symptoms are of a mental (or visceral) type. Frontal (occipital ?) region earlier and more markedly affected.

In Group 1 the principal points are :

(*a*) Slight ataxy of movements, especially if an attempt be made to move quickly.

(*b*) Marked tremors on movement—seen more especially, or even solely, in the lips and tongue—as though the muscles tired very easily.

(*c*) Sluggishness of pupils in performing any movement, and particularly every bizarre movement ingenuity can suggest, dilating with light and contracting with shade, contracting with relaxed accommodation, acting independently of one another in opposite directions, etc., etc.

(*d*) Knee-joints markedly increased ; this is almost constant in the early stages when differential diagnosis may be difficult.

(*e*) Fits of most extraordinary kinds, resembling epilepsy in suddenness of onset, but resembling also every other kind of fit it is possible to conceive, hemi- or mono-plegic, gastric or other crisis, uræmic, etc. (The widespread affection in the cortex and slight accidental local congestion gives the clue to these.)

(*f*) Progressing general muscular weakness of the limbs.

In Group 2, which is the group that principally interests us as medical jurists, the points are :

(*a*) Loss of memory.	(*a*) Often denied by the patient, but noticeable enough by those who know him, may lead to his being lost and so requiring the kindly offices of a policeman.
(*b*) Passionate outbursts.	(*b*) May lead to his committing some crime (of assault) on others.
(*c*) Delusions, usually of exaltation, may be of depression.	(*c*) These delusions usually (exaltation) prevent any idea of suicide, but if the patient be contradicted they may possibly lead to the outbreaks of temper and consequent criminal acts. They also may bring him into contact with the law by allowing or leading him into extravagance beyond his means, and even into the most barefaced forgery or robbery, signing cheques for large amounts, for example, with no bank balance to meet them.
(*d*) Restlessness.	(*d*) Often very marked, but of no particular consequence so long as the patient can find the way home or remember where he lives.
(*e*) Insomnia.	(*e*) A most bitter complaint of many of the victims, but its actual occurrence should be verified by inquiry of someone who is with the patient at night.

This by no means exhausts, even in tabular form, the details of either aspect of the disease, but the points are sufficient to enable one to perceive how a general paralytic may come into conflict with the law, or under its protection.

(*i*). Erotomania. Aidoiomania.

Erotomania has been described by Esquirol as a chronic affection of the brain leading to mental disorder, in which amorous ideas are as predominant and as uncontrollable as religious ideas in some cases of religious melancholia. It occurs in both sexes, and in his opinion it differs from nymphomania and satyriasis in the fact that it has its origin in primary disturbance of the functions of the brain from disease. In nymphomania, however, the female sexual organs, and in satyriasis the male sexual organs, are at fault. These two mental conditions he regards as depending on morbid states of the sexual organs. Marc has suggested that the term *aidoiomania* (from αἰδοῖον, pudendum) is more appropriate : it signifies *furor genitalis*, and includes both nymphomania and satyriasis ("De la Folie," vol. 2, p. 182).

It cannot be denied that, from sympathy between the genital organs and the brain, mania may sometimes show itself by excessive sexual desires leading to attempts by one on the other sex. When the disorder of the mind is established from the general conduct and conversation of the person, there is no difficulty in recognising and admitting such cases; but when, on a charge of rape, it is alleged that the assailant laboured under aidoiomania, and was unable to control his desires, it then becomes a question how far such a defence is medically, morally, and legally admissible. When it is alleged that a man charged with this crime was led on by an irresistible impulse, and that he had not the power to control himself, it will devolve upon him to satisfy a jury on this point. This is the very difficulty to the admission of such a defence. Excessive amorous propensities may exist in sane and responsible persons, and if unresisted by due moral control, they might in a certain sense be described as irresistible; but this will hardly satisfy a court of law that a man could not help perpetrating a rape, when time and circumstances were especially favourable for such an assault on a woman. The sane ravisher will generally seek his opportunity, the real maniac will attack any woman openly and indiscriminately.

Such a defence is rarely set up in a case of rape, for the reason, no doubt, that all the circumstances of the case would be adverse to it. In only one instance has insanity been pleaded for a criminal assault on a woman: it was tried at Glasgow on December 23rd, 1862.

The crime was committed on November 12th. On the following day, in his examination the accused, a married man, æt. 40, appeared to be calm and collected and nowise different from other men. The account he gave of the transaction was that he thought he was under the influence of the magistrates, and that he would lose his life if he did not have connection with the prosecutrix. They had a struggle together, and then he committed the act. His mother stated that he had been subject to fits of an epileptic character, which left him in a stupid state and scarcely conscious of his actions. He was also subject to delusions. It appeared that a few days before the commission of the crime he had had several seizures of more than usual violence, and it was suggested that at the time of the act he was under the influence of some of his delusions. The jury returned a verdict of "not guilty on the ground of insanity" (*Edin. Month. Jour.*, February, 1863, p. 772).

The act was perpetrated with a proper attention to opportunity, and under the same animal impulse as would have been manifested by a person not subject to epileptic fits. There was no proof that his insanity had shown itself on previous occasions in a sexual shape, or that it had reached such a pitch as to render him more ignorant than other ravishers of the criminality of the act.

Professor D. Mann very sarcastically, but in the editor's opinion very truly, says that when crimes are associated with rape the plea of insanity is not brought forward because the criminal is too unclean for "philanthropists and *pseudo*-philanthropists to rush into print in season and out of season on his behalf," a remark which only shows how false and hollow is the sentimentality surrounding criminal responsibility (*q.v.*, *infra*).

The following case of mixed eroto- and pyro-mania is interesting both for the example itself and for the way in which medical men may

in private become concerned with such cases. It is reported by Dr. Nelson Hardy to the editor:—

In August, 1899, I was asked to visit Mr. J. M., a retired merchant, about sixty years of age, who was in a private asylum at Tooting, and thought he was wrongfully confined there, and wished to have proceedings taken for his release. I had some previous knowledge of this gentlemen, who had a wife and grown-up family living in London, and had had what he called a studio in another part of town (though no artist), to which he was in the habit of bringing ladies. I had accidentally come across him during a short visit to the Isle of Wight, where he was going about with a person whom he called his niece, but who turned out to have been a housemaid in a doctor's house where he had formerly been a voluntary patient, whom he had induced to come and look after him. I afterwards learned that this girl, to save appearances, though she declared that nothing wrong had happened, had got another domestic to come and live with her, when Mr. M., who had plenty of means, had taken a furnished house at Ryde. As a matter of precaution, these girls locked themselves in their room at night; and one night Mr. M. greatly alarmed them by shouting out, "I'll ravish you, I'll ravish you," and then tried to set fire to the house by applying lighted matches to the curtains. The police being called in, he was charged the next day at the police-court with attempted arson, and his friends from London had some difficulty in getting him off.

At the asylum I was told by the superintendent that he was so erotic that no housemaid could be allowed to go near him: that he had several times exposed himself in a nude state at the windows, had violently assaulted one of the attendants, and had secreted matches with the apparent object of setting fire to the place: that he was cunning and lying, and had attempted to bribe the attendants to take out advertisements representing that he had been kidnapped.

I had a conversation of twenty minutes or half an hour with him, during which he attempted to explain away the charge of attempted arson by saying it was an accident. I reported to his friends that in my opinion it would be quite unsafe to let him have his liberty, as there would be great risk of his doing something which would land him in a criminal lunatic asylum for life.

(*j*). Kleptomania.

This term has been applied by Marc to that form of monomania which is said to manifest itself by a propensity to acts of theft. There are several instances on record showing that well-educated persons, moving in a respectable sphere of society, have been guilty of petty acts of theft. The articles taken have been valueless compared with their means. Instances of this kind have been brought before our police-courts, and a motiveless impulse to theft has been occasionally pleaded; but in most of them the following facts have been clearly established by evidence:—1. A perfect consciousness of the act and of its illegality. 2. The article, though of trifling value, has still been of some use to the person—thus women have stolen articles either adapted to female use, or on which money could be raised. 3. There have been art and precaution in endeavouring to conceal the theft; and 4, either a denial of the act when detected, or some evasive excuse. When circumstances of this kind are proved, either the parties should be made responsible, or theft should be openly tolerated. The evidence of a disordered state of mind should not be allowed to depend on the nature of the act, or every morally depraved person might bring forward a plea of insanity for any crime or offence (see case, "Ann. d'Hyg.," 1838, 2, p. 435). In a case which came before a police-court in 1865, a respectable woman was charged with stealing meat from a butcher's shop. It was alleged

in defence that she had committed the theft while in a state of unconsciousness, although she had denied possession of the stolen article, and had endeavoured to conceal it when charged with stealing. A plea of insanity might have led to her committal for trial; but the solicitor who appeared for the defence then said it was not exactly insanity, but "mental weakness," under which she laboured, and this affected her actions. She was fined for the theft, which had all the usual characters of sanity about it.

R. v. *Collins* (London County Sessions, April 29th, 1895). Defendant, a dentist, was indicted for stealing articles at his club. Medical evidence given that, though not insane, he was sufficiently affected mentally to rebut the presumption of any felonious intent. Acquitted.

(*k*). Pyromania.

This is described as a variety of monomania in which there is a morbid disposition of mind leading to impulsive acts of incendiarism without any motive. It is a condition not specially recognised by English jurists or in English courts of law. We are informed by the advocates of its independent existence that it proceeds from a sudden impulse, or from delusive reasoning, but most commonly the latter. The case of Jonathan Martin has been frequently quoted as an instance of pyromania. He had, however, merely a delusion that he was deputed by God to burn down the York Cathedral, in order to do away with the heresies which he supposed to exist in the church. There was no doubt of his insanity; and he had been already twice confined in an asylum. Nevertheless, the act was perpetrated with much method.

It seems that Martin remained behind after the afternoon service in the cathedral, and when left alone he went up into the belfry, cut off about eighty or ninety feet in length of the prayer-bell rope, which, being usually rung from below, had been drawn up and coiled up to that length there. With this rope he succeeded in knotting a sort of ladder, and throwing it over the iron gates of the choir, he climbed over by means of the knots. Being in the choir, he struck a light with a flint and his razor, lighted a candle which he had brought, collected the prayer-books, and set fire to the paper, close to the carved work at the Archbishop's throne, in two piles. He then cut away a silk curtain, gold fringe, etc., which he stole, and getting back by his rope-ladder into the body of the cathedral, he escaped through a window on the north side—the most unfrequented part. He had provided himself with a pair of pincers, by which he forced the window, and let himself out by his rope-ladder to the ground.

A sane criminal could hardly have devised a better method of perpetrating the act, or of escaping after its perpetration. The defence, as in most of these cases, was insanity at the time of perpetrating the act, and not specially pyromania.

This so-called mania is said to be not uncommon in young persons of both sexes about the age of puberty. Assuming that a morbid impulse of the kind may exist, it should be cautiously received as an exculpatory plea, since otherwise it might be easily converted into a means for withdrawing criminals from legal control. Casper denied, with great probability, the existence of such a propensity as having any connection with insanity. He believed that incendiarism, perpetrated either with or without motive, is always a criminal act: and unless there is evidence of a disordered mind, it should always be

punished as a crime ("Denkwürdigk. zur Med. Stat.," Berlin, 1846, p. 255 : see also *Vierteljahrsschr.*, 1853, 1, p. 34). A defence of this kind has been admitted in English law, but only in those instances in which there was reason to suspect the existence of intellectual aberration (*Med. Gaz.*, vol. 12, p. 80). In one case (*Reg.* v. *White*, Wilts Sum. Ass., 1846) the prisoner was convicted, on the principle that, although of weak intellect, she had reason enough to know right from wrong. (See "Ann. d'Hyg.," 1833, 2, p. 357 ; 1834, 2, p. 84.)

Among important trials in which a plea of insanity has been urged in defence in cases of arson is that of James Gibson, tried before the High Court of Justice, Edin., December 23rd, 1844, and of which a report will be found in vol. 4 of Brown's "Rep. of Cases before the High Court," 1845, p. 232.

The prisoner was charged with setting fire to certain premises, and the defence chiefly rested upon the allegation that he was in a state of mind which rendered him irresponsible for the act. Medical evidence was adduced in support of this proposition, but it failed to show that the insanity, if it really existed, had reached such a degree as to render the accused legally irresponsible; and it did not appear that any of the circumstances on which the medical witnesses relied as proofs of insanity had manifested themselves until *after* the perpetration of the crime with which he was charged. The prisoner was convicted.

There was nothing in this case to justify a remission of the usual punishment assigned to arson. Although it is here noticed under the Section of "Pyromania," yet, strictly speaking, the defence turned rather upon the alleged existence of general insanity than upon that form of it in which the insanity is supposed to be attended with a propensity to incendiarism.

(*l*). Somnambulism.

This term signifies sleep-walking, but the medico-legal facts are chiefly confined to acts of violence perpetrated unconsciously during the state of sleep, in which it is presumed that malice and intention, the chief ingredients of crime, are wanting. It has been a contested question among medical jurists how far a person should be held responsible for a criminal act perpetrated in that half-conscious state which exists when he is suddenly roused from sleep. There is no doubt that the mind is at this time subject to hallucinations and illusions, which may be more active and persistent in some persons than in others; but it is difficult to suppose, unless we imagine there is a sudden access of insanity, that a person should not recover from the delusion before he could perpetrate an act like murder. A case of this description, that of Bernard Schedmaizig, will be found reported by Marc (*op. cit.*, vol. 1, p. 56).

This man suddenly awoke at midnight, and saw before him, as he believed, a frightful phantom. He twice called out, "Who is that?" and receiving no answer, and imagining that the phantom was advancing upon him, he seized a hatchet which was beside him, attacked the spectre, and it was found that he had murdered his wife. He was charged with the murder, but pronounced "not guilty" on the ground that he was not at the time conscious of his actions. A trial involving this question occurred in England. A pedlar in the habit of walking about the country armed with a sword-stick, while lying asleep on the high-road, was roused by a man accidentally passing, who seized and shook him by the shoulders. The pedlar suddenly awoke, drew his sword, and stabbed the man, who soon afterwards died.

The pedlar was tried for manslaughter. His irresponsibility was strongly urged by his counsel, on the ground that he could not have been conscious of an act thus perpetrated while in a half-waking state: this defence was supported by the opinion of a medical witness. The prisoner was, however, found guilty.

Under such circumstances, it was not unlikely that an idea had arisen in the prisoner's mind that he had been attacked by robbers, and therefore had stabbed the man in self-defence (*Rex* v. *Milligan*, Lincoln Aut. Ass., 1836). When there is enmity, with a motive for the act of homicide, the murderer, while sleeping in the same room, may select the night for an assault, and perpetrate the act in darkness in order the more effectually to screen himself.

In *Reg.* v. *Jackson* (Liverpool Aut. Ass., 1847) it was urged in defence that the prisoner, a woman who slept in the same room with the prosecutor, had stabbed him in the throat, owing to some sudden impulse during sleep; and the case of Milligan (above given) was quoted in support of the view that the prisoner was irresponsible for the act. It was proved, however, that the prisoner had shown malicious feeling against the prosecutor, and that she had wished him dead. The knife with which the wound had been inflicted bore the appearance of having been recently sharpened, and the prisoner must have reached over her daughter (the prosecutor's wife), who was sleeping in the same bed with him, in order to inflict the wound. These facts were adverse to the supposition of the act having been perpetrated in a state of unconsciousness in awaking from sleep, and the prisoner was convicted. In *Reg.* v. *Minchin* (C. C. C., June, 1853), in which a young woman was charged with having wounded the prosecutor during the night, the same plea was put forward but rejected. There was nothing to show that the prisoner was not aware of what she was doing. There was, apparently, an absence of motive, but, as it has been elsewhere stated, this alone does not create irresponsibility. In another case (*Reg.* v. *French*, Aut. Dorset Ass., 1856), it was proved that the prisoner, while sleeping in the same room, had killed the deceased, who was a stranger to him, under some delusion. There was, however, clear evidence that the prisoner was insane, and on this ground he was acquitted under the direction of the judge. In *Reg.* v. *Byron* (Winchester Wint. Ass., 1863) it was proved that a blow struck by a drunken person during sleep had caused death. The man was charged with manslaughter under the following circumstances:—The prisoner and the deceased were soldiers in the same regiment. The prisoner was in the street drunk, and the deceased seeing this, took him in, to prevent his being arrested for drunkenness, and placed him on his bed. In this state he lay for some time quite drunk and insensible. In the course of the afternoon the deceased went upstairs to see him; he tried to waken him, when the prisoner suddenly kicked out, and his boot came violently against the lower part of the abdomen of the deceased. The prisoner did not awake, but appeared then to be quite insensible. The deceased died, and it was found that the blow had caused rupture of the intestines. As in order to constitute the crime of manslaughter, it must be shown that the person charged did something knowingly, and the prisoner was not in a state to have known anything, it was held that there was no case against him and he was acquitted.

The act was committed during sleep, but the sleep appears to have been the result of voluntary drunkenness.

Somnambulism may become a subject of discussion under a contested policy of life insurance, in which it may be provided that it shall be vitiated by suicide. If a man fall from a height and is killed while in a state of somnambulism, would this be considered an act of suicide within the meaning of the policy? The proviso against suicide has been held to include only *intentional* killing (case of *Borrodaile* v. *Hunter;* also *Med. Gaz.*, vol. 36, p. 826), and in death under these circumstances the killing cannot be said to be intentional: it can only be regarded as an accident—therefore it is reasonable to infer that the policy would not be void. It is impossible, however, to lay down

any general rules relative to cases of this description; since the circumstances attending each case will sufficiently explain how far the act of murder or suicide had been committed during a state of somnambulism, or under an hallucination continuing from a state of sleep.

The editor is not aware of anything more than an inquest on fatal accidents during somnambulism having occurred in recent years.

(*m*). Deaf-mutism.

It was formerly laid down in the old law-books that a person born deaf and dumb was by presumption of law an idiot, but in modern practice want of speech and hearing does not imply want of capacity either in the understanding or memory, but only a difficulty in the means of communicating knowledge; and when it can be shown that such a person has understanding, which many in this condition reveal by signs, he may be tried, and suffer judgment and execution (Archbold). A deaf-and-dumb person is not incompetent to give evidence, unless he is also blind. He may be examined through the medium of a sworn interpreter who understands his signs. The condition (deaf-mutism) does not justify restraint nor interdiction, unless there is at the same time mental deficiency. A deaf-and-dumb person who has never been instructed is altogether irresponsible for any action, civil or criminal. Such a person cannot even be called on to plead to a charge, when there is reason to suppose that he cannot understand the nature of the proceedings.

A deaf-and-dumb woman was charged with cutting off the head of her child. By signs she pleaded "not guilty," but she could not be made to understand the nature of the other proceedings against her. Upon this she was discharged, and subsequently confined as a criminal lunatic. In *Reg.* v. *Goodman* (Stafford Sum. Ass.), a deaf-and-dumb man was convicted of theft and sentenced to imprisonment. He was made to comprehend the proceedings by signs and talking with the fingers. In *Reg.* v. *Brook* (Buckingham Sum. Ass., 1842), the prisoner could read and write well. He was charged with feloniously cutting and stabbing. The proceedings were reported to him in writing.

He was convicted, and Alderson, B., having sentenced him to a year's imprisonment, handed down his judgment in writing, which he recommended him to read and ponder over in prison. In *Reg.* v. *Jackson* (Bedford Sum. Ass., 1844), Alderson, B., held that before the evidence of a dumb witness can be received, the court must be satisfied that he understands the obligation of an oath.

It has been decided in the Ecclesiastical Courts that the consent of a deaf-and-dumb person given by signs, renders a matrimonial contract valid, provided the person has a full and proper understanding of their meaning. An incompetency to enter into contracts or unsoundness of mind must not be inferred to exist merely in consequence of a person being deaf and dumb. In the case of *Harrod* v. *Harrod* (Vice-Chanc. Court, June, 1854), an attempt was made to deprive the plaintiff of his rights on the ground that he was an illegitimate child. The marriage of his parents had taken place thirty years previously, but the marriage was said to be void by reason of the alleged incapacity of his mother to enter into the contract; the mother was deaf and dumb, and of more than ordinary dull intellect. Wood, V.-C., said there was an

important difference between "unsoundness of mind" and "dulness of intellect." The presumption in such cases was always in favour of sanity, and the fact of a person being deaf and dumb did not raise a presumption the other way. Experience in asylums showed that the deaf and dumb were not necessarily of unsound mind. The woman had assented to the marriage in form and substance, and with a perfect knowledge of what she was doing. In the ceremony of marriage it had never been held that the repetition of the words was necessary. The woman conducted herself with great propriety before and after the marriage, and a child was born in due course. There was no ground for an issue.

From these statements it will be perceived that medical evidence is of but little importance in relation to the deaf and dumb. Indeed, there are only two cases in which this kind of evidence is likely to be called for—1st, when there is accompanying *mental deficiency*, in which case the general rules elsewhere given are applicable; and 2nd, when there is a suspicion that the deafness and dumbness are *feigned*. There will be no great difficulty in detecting an imposition of this kind (*vide infra*).

5. LUCID INTERVALS.

By a lucid interval, we are to understand, in a legal sense, a temporary cessation of the insanity, or a perfect restoration to reason. This state differs entirely from a remission, in which there is a mere abatement of the symptoms. It has been said that a lucid interval is only a more perfect remission, and that although the lunatic may act rationally and talk coherently, yet his brain is in an excitable state, and he labours under a greater disposition to a fresh attack of insanity than one whose mind has never been affected. Of this there can be no doubt, but the same reasoning would tend to show that insanity is never cured; for the predisposition to an attack is undoubtedly greater in a recovered lunatic than in one who is and has always been perfectly sane. Even admitting the correctness of this reasoning, it cannot be denied that lunatics do occasionally recover, for a longer or shorter period, to such a degree as to render them perfectly conscious of, and legally responsible for their actions like other persons. The law intends no more than this by a lucid interval: it does not require proof that the cure is so complete that even the predisposition to the disease is entirely extirpated. Such proof, even if it could be procured, would be totally irrelevant. If a man acts rationally and talks coherently, we can have no better proof of a restoration of reason. If no delusion affecting his conduct remains in his mind, we need not concern ourselves about the degree of latent predisposition to a fresh attack which may still exist.

Lucid intervals sometimes appear suddenly in the insane: the person feels as if awakened from a dream, and there is often a perfect consciousness of the absurdity of the delusion under which he was previously labouring. The duration of the interval is uncertain, and may last for a few minutes only, or may be protracted for days, weeks, months, and even years. In a medico-legal view, its alleged existence must be always looked upon with suspicion and doubt when the interval is very short. These lucid intervals are most frequently seen in cases

of mania and monomania; they occasionally exist in dementia when this state is not chronic, but has succeeded a fit of intermittent or periodical mania. They are never met with in cases of idiocy and imbecility. It is sometimes a matter of great importance to be able to show whether or not there exists or has existed a lucid interval, since, in this state, the acts of a person are deemed valid in law. The mind should be tested, as in determining whether the patient is labouring under insanity or not. He should be able to describe his feelings, and talk of the subject of his delusion, without betraying any signs of unnecessary vehemence or excitement. It may happen that a person who is the subject of a commission of inquiry, is at the time of examination in a lucid interval, in which case there may be some difficulty in forming an opinion of the existence of insanity. It has been said that a person in a lucid interval is held by law to be responsible for his acts, whether these are of a civil or criminal nature. In regard to criminal offences committed during a lucid interval, it is the opinion of some medical jurists that no person should be convicted under such circumstances, because there is a probability that he might at the time have been under the influence of that degree of cerebral irritation that renders a man insane. This remark applies especially to those instances in which the lucid interval is very short. Juries now very seldom convict, however rationally in appearance a crime may have been perpetrated, when it is clearly proved that the accused was really insane within a short period of the time of its perpetration.

Sudden lucid intervals are by no means infrequent, especially in epileptics, but they reach their acme in the so-called recurrent mania. "A well marked form of mental derangement occurring in cycles" (Urquhart, Allbutt, *loc. cit.*).

The following case of lucid interval or recovery has bearings, as will be seen by the judgment, far beyond mere lunacy, and is too important in its principles to omit. The report is taken from the *B. M. J.* for May 5th, 1900.

Style v. *Owen and Marriott.* On April 30th, Mr. Justice Ridley delivered a considered judgment in the case of *Style* v. *Owen and Marriott.* The action was brought by the plaintiff, a surgeon residing in Cambridge Road, Bethnal Green, to recover damages from Dr. William Owen, of Shore Road, Hackney, and J. R. Marriott, the Relieving Officer of the Hackney Union, for imprisoning the plaintiff's wife and depriving him of her society. It seems that the plaintiff and Dr. Owen had been on terms of friendship for several years. The plaintiff's wife had been confined in an asylum, but had recovered and returned home; but her malady reappeared and she conceived a violent dislike of her husband. On the night of May 13th she ran away from home, and was traced to the house of Dr. Owen. The plaintiff then sent to Dr. Owen's house to try to induce his wife to return home, but she refused to go. The plaintiff was at this time intending to send her to a private lunatic asylum. On the following day Dr. Owen sent Mrs. Style to the Hackney Workhouse, an order for admission to which had been signed by the relieving officer. The record as against the relieving officer was withdrawn in the course of the case.

Dr. Owen, in reply to the charge of imprisoning the plaintiff's wife, said that she absolutely declined to return to her home, that she went to the workhouse of her own free will, and that in his opinion she was not insane.

Witnesses were called to prove that Mrs. Style went to the union of her own free will, and that she could have applied for a discharge whenever she liked.

In the course of his judgment Mr. Justice Ridley said that, although it was difficult to say what the motives of Dr. Owen were in acting as he did, he (the learned judge) was of opinion that he had acted from motives of humanity towards

tho plaintiff's wife. He therefore gave judgment for the defendant, but without costs.

Tho finding of Mr. Justice Ridley that tho defendant had acted "from motives of humanity" had a very important bearing upon the legal aspect of this case. It was decided, in the case of *Winsmore* v. *Greenbank*, which was heard in the Court of Common Pleas in 1745, that an action lies against a person who persuades or entices a wife to continue absent from her husband, whereby the husband loses her comfort and society. In a later case of *Philp* v. *Squire* (1820, Peake 82), Lord Kenyon said: "Where a wife is received on principles of humanity the action cannot be supported. If it could, the most dangerous consequences would ensue, for no one would venture to protect a married woman."

Recovery.—The editor, after many serious discussions with alienists, feels firmly convinced that recovery is *always* a comparative matter, and that it is extremely unsafe to allow a person who has once been confined in a lunatic asylum to be placed again under the same circumstances of strain that caused the original outbreak. Why, for instance, should the following cases be possible? and they are not isolated ones, they are only illustrations of an extremely common event, which could be in some measure prevented by never discharging any lunatic who has at any time shown any approach to homicidal tendencies:—

Harriet Baker, of Wakering, near Southend, was indicted at Essex Assize for the wilful murder of her daughter, Elsie Baker, aged six.

On May 6th Elsie refused to go to school, and later the school attendance officer called at the house. Prisoner seemed worried at what he said, and soon afterwards neighbours heard shuffling sounds upstairs in the prisoner's cottage, followed by an agonised cry.

A couple of hours later Mrs. Smith, living next door, saw the prisoner in her garden covered with blood. Prisoner said, "I have hit my little girl. Go upstairs and see if I have hurt her."

Mrs. Smith sent for the police, who found Elsie on the bedroom floor, her head being battered in and a coal hammer lying beside her.

Prisoner, when charged with the murder, said she knew nothing about it.

Medical evidence was called to show that the prisoner had been in an asylum, and that at the time of tho crime she was not responsible for her actions.

The jury found prisoner guilty of murder, but added that she was insane at the time she committed it.

Prisoner was ordered to be detained during his Majesty's pleasure.

On Christmas-eve, 1903, Mrs. Mould, the wife of the landlord of the Wallington Inn, who was discharged as cured from the County Asylum, was out for a walk with her son, when he missed her. She was found later in the evening, when she stated she had thrown a boy into the canal. Little notice was taken of her assertions, as it was thought her mind had again become unhinged. On Christmas morning the parents of Hubert Boulter, a little boy aged six, notified the police of his disappoarance. Connecting the circumstance with Mrs. Mould's statements, the police arrested her, and commenced dragging operations. The body of Hubert Boulter, the missing boy, was recovered from the canal. Mrs. Mould was arrested and charged at the police-station with causing the death of the boy, by drowning him in the canal. She made no answer to the charge.

6. HEREDITY IN AND CAUSES OF INSANITY.

The only reason for introducing this subject into a medico-legal work arises in the fact that when philanthropists are seeking to respite a criminal they frequently find no evidence of insanity in the prisoner's actions, beyond the crime, and they are forced back onto the evidence that some of his relatives were insane.

There can be no doubt, from the concurrent testimony of all writers

on insanity, that a predisposition to this disease is frequently transmitted from parent to child through many generations. The malady may not always show itself in such cases, because the offspring may pass through life without being exposed to any exciting cause; but in general it readily supervenes from very slight causes. Esquirol has remarked that this hereditary taint is the most common of all the causes to which insanity can be referred, especially as it exists among the higher classes of society. Among the poor, about one-sixth of all the cases may be traced to hereditary transmission; and other authorities have asserted that in more than one-half of all cases of insanity no other cause can be found for the malady.

Dr. Savage (Allbutt, *loc. cit.*) states:—"I believe that in fully one-third of all the cases of ordinary insanity a history of insanity is to be detected in the family." In asylums records of the family history are carefully kept, and seem to bear out Dr. Savage's statements. It must not be understood, however, that the forms of insanity "breed true" as a matter of course. Thus epileptic parents may have one child an epileptic, one an imbecile, another daughter may fall in her puerperium, and so on; in other words, insanity in its widest aspect means "brain inadequacy for its environment," and this inadequacy may show itself in any one of the recognised forms, from mere eccentricity to imbecility or mania.

We may certainly admit these statistics and yet inquire what bearing they have on the criminality of the individual in question. No more frequent question is put by lawyers to a medical witness than "Is it *possible* for ——— ?" and it is a fair retort for a witness in the present connection to ask, "Is it *possible* for an insane person to have sane progeny?" The reply must be yes.

In some trials there has been a tendency to rely upon hereditary predisposition as almost the sole proof of insanity in the criminal. In the case of Christiana Edmunds, convicted of the crime of poisoning on an extensive scale, no evidence of intellectual insanity or of homicidal impulse could be found. There was a motive, an endeavour to fix the crime upon others, great skill in its perpetration, concealment with a full knowledge of the consequences of the act and of the punishment attached to it, and an endeavour to avoid this punishment by a false plea of pregnancy. In short, the conduct of the woman throughout was that of a sane criminal. The jury found her guilty; but in consequence of proof being furnished that many members of her family had suffered under insanity in some form, it was supposed that there might be some latent degree of insanity in her case, not discoverable by the ordinary methods of examination. This led to the commutation of her sentence.

In the case of Arthur O'Connor, who made an attempt on the life of the Queen in 1872, hereditary taint was one of the strongest points put forward in the defence, but it failed to satisfy the court, and the prisoner was convicted. In the opinion of Tuke, this youth was so far insane as to render him irresponsible for the daring act (*Lancet*, 1872, 1, p. 571). This kind of evidence has been frequently rejected in other cases. Opinions vary very materially as to the degree of weight to be attached to family history in considering the possibility of a criminal being insane; but all are agreed that *if it be the only element*

of suspicion in the case it is an extremely weak piece of evidence. It would be a most dangerous doctrine to consider a criminal insane because some of his relatives have shown instability of mind. It is most necessary to prove also some insanity in the personal history. Nevertheless attempts are frequently made to get a criminal off on this ground alone. The case of *Reg.* v. *Prince*, C. C. C., January, 1898, is interesting in this connection.

The extent to which the disposition to insanity prevails through families is great; but there is great difficulty in getting at the truth, unless the information can be obtained from some friend who is well acquainted with the family. There is no point upon which persons in every station of life are more desirous of concealment; and relatives are always ready to deny the existence of a family taint. They will admit, perhaps, that some member of the family has been a little eccentric—nothing more than that; one has only had a 'brain fever'; 'delirium after her confinement,' which they say goes for nothing; or perhaps it will be admitted that some child has had congenital 'deficiency' (Millar, *op. cit.*, p. 10). Millar states, as the result of his experience, that he has good reason for believing that many of the reputed attacks of brain fever have been nothing more than cases of acute mania. In spite of the existence of a strong hereditary taint, however, insanity rarely manifests itself except when the exciting causes lead to the loss of natural sleep.

The following, taken from the *Lancet*, 1, 1903, is an excellent illustration of the wild raising of a plea of insanity in the family :—

> Edgar Edwards, or Edwin Owen, as his name was stated to be by the one witness called on his behalf at his trial, was on February 13th sentenced to death by Mr. Justice Wright, at the Old Bailey. He was convicted of murdering William John Darby, with his wife and child, upon evidence that allowed no shadow of doubt as to his guilt, although, to use a term of which the late Sir James Fitzjames Stephen strongly disapproved, it was entirely circumstantial, for no one ever saw the murderer in the company of any of his victims, or had ever heard him express ill-will against them. The defence raised, so far as the thankless task of raising a defence was attempted by his counsel, was that of insanity. It was supported by no medical evidence, but a witness who said that he was the prisoner's uncle by marriage, informed the court that the prisoner's mother's brother lived and died a lunatic, that the prisoner's maternal grandfather had a married sister who had been in a lunatic asylum, and that one of the witness's daughters—that is to say, a first cousin of the prisoner—was now under control. He added that the prisoner's father died a confirmed dipsomaniac, having squandered in drink the fortunes of himself, his wife, and his two sisters. This is the kind of family history which, if it had been so given that its truth could have been tested and relied upon, might well have paved the way for medical evidence of insanity in the prisoner himself had the defence been able to call any. It was, however, unsupported by any medical evidence, and Dr. James Scott, medical officer at Brixton Prison, who had kept the accused under close observation, went into the witness-box and said that he had seen nothing to indicate mental derangement. The prisoner's counsel dwelt upon the smallness of the motive that prompted the crime, but smallness of motive is no new thing in murder cases. The prisoner apparently tried to support the suggestion of insanity by a demeanour which no doubt seemed to him appropriate, and by the exhibition of callous insolence even when sentence was being pronounced upon him. Probably the learned judge was right when he said there might be some unsoundness of mind to account in a measure for his acts. He is an able-bodied and apparently not unintelligent man who might have earned an honest livelihood, but instead has lived a life of crime and spent nearly fifteen years of his life in prison. This fact was kept from the public until the trial was over. Such a life and such an act as the murder of the Darby family are not characteristic of normal moral instincts and inclinations;

there is nothing, however, in them to indicate that the convict who has now reached the end of his career did not do all that he did with full knowledge of its wickedness, deliberately accepting the possible consequences, while he took all the steps in his power to avoid them.

Dixon Mann, "For. Med.," p. 354, quotes Bucknill as follows:—"The argument in favour of insanity founded upon the supposed transmission of an hereditary tendency to mental disease has of late been used in most absurd and unjustifiable excess, and I do not know that the interests of justice would be damaged if it were to be excluded altogether in judicial inquiries; for if it could be clearly shown that both a man's parents, and all four of his grand-parents, and all his uncles and aunts had been unquestionably insane, it would afford no proof whatever that the man himself had been insane. Such evidence would at the most strengthen the presumption that he had been so under circumstances which would otherwise be more doubtful."

Causes of Insanity.—The causes of insanity may be either moral or physical. A full account of them, with the relative numbers attacked, has been published by Hawkes (see *Lancet*, 1872, 2, p. 666). Among the ordinary *causes* may be enumerated severe domestic affliction, loss of near relatives or friends, great pecuniary losses, disappointments, long watching, anxieties either as to the health of friends or success in business, severe and long-continued mental exertion, excessive study, ambition, the puerperal state, amenorrhœa, masturbation, drunken habits, over-excitement on the subject of religion or politics, and in general all those disorders which cause depression of health and spirits, and which are accompanied by loss of sleep. About one-third of the existence of man is passed in sleep, and this quiescence or repose is as necessary to mental as to bodily health. One of the earliest symptoms of insanity is a tendency to wakefulness (Millar, *op. cit.*, p. 9).

Blows on the head, accidental falls, and strokes of lightning, have been known to operate as physical causes of insanity. It is very probable, in reference to these mechanical injuries, that but for an hereditary taint in the family they would not be followed by an attack of insanity.

LUNACY IN RELATION TO THE LAW.

1. Capability as a Witness.

A question of some importance has arisen regarding the admissibility of the testimony of lunatics concerning facts which they allege they have witnessed. According to Stephen, J.,

> Madmen, in respect to competency as witnesses, are precisely on the same footing in relation to testimony as in relation to crime. If they understand the nature of an oath, and the character of the proceedings in which they are engaged, they are competent witnesses, whatever may be the nature or degree of their mental disorder ("Crim. Law of Eng.," p. 288).

As ancient legal dicta on this subject, we find the following:—

> "An idiot shall not be allowed to give evidence (Co. Litt. b. 6; Gilb. Evidence, p. 144), nor a lunatic (*Ib.*) except during a lucid interval (Archbold, "Pleading and Evid. in Crim. Cases," p. 124)."

But it is now known and admitted that the shades of insanity are infinite—that some lunatics are as fully competent to observe and remember facts, and to understand the obligations of an oath, as persons who are sane; hence, therefore, incompetency to give testimony must not be inferred from a mere name assigned to the malady under which a person is labouring, but it must be decided by the special condition of the lunatic. Under any other view crimes of the greatest enormity might be perpetrated in lunatic asylums without the possibility of convicting the offenders. It has been appropriately remarked by a good authority, that the fact of incompetence to testify is not necessarily connected with a state of insanity; and it would be far more correct to consider it an independent fact to be established by a distinct order of proofs. The truth is, an analogy in a medico-legal sense has been too hastily assumed between the act of testifying and that of performing business-contracts and other civil acts; and, in consequence, it has shared with them in the same sentence of disqualification, without an attempt to ascertain the kind and degree of intellectual power which they respectively require (Ray, "Med. Jurispr. of Insanity;" and *Med. Gaz.*, vol. 47, p. 150).

In the case of *Reg.* v. *Hill* (C. C. C., 1851), the evidence of a man named Donnelly was tendered on the part of the Crown (*Jour. of Psych. Med.*, 1851, pp. 279 and 436). This man was a pauper lunatic, and was confined as such in the same ward with the deceased, who it was alleged had been maltreated and killed by the prisoner. It was quite clear from the examination of Donnelly at the trial that he laboured under insane delusions that he was constantly visited by spirits, etc.: nevertheless, he gave a clear and consistent account of the mode in which deceased was maltreated by the prisoner; and although he professed his firm belief in the existence of spirits and their secret power of communicating with him, he appeared to have a full knowledge of the difference between truth and falsehood. His evidence was received, and upon this the prisoner was convicted.

The case was subsequently argued in the Exch. Chamber before all the judges, and decided in favour of the admissibility of the evidence. It may therefore be considered as settled, that a lunatic who labours under delusions, but who in the judgment of a medical practitioner is capable of giving an account of any transaction that happened before his eyes, and who appears to understand the obligation of an oath, may be called as a witness (*Reg.* v. *Hill*, "Denison's Crown Cases," 2, p. 254). The rule laid down by Parke, B., is in accordance with this view:

It is for the judge to say whether the evidence of the witness is admissible, and then his credibility is a question for the jury.

In the spring of 1852, Donnelly's (the witness in the above case) powers of observation and reasoning were very acute and quite sound, except when reference was made to his peculiar delusions regarding spirits.

In another case, on appeal (Middlesex Sess., December, 1852), the testimony of a lunatic was tendered on the part of the respondents, but objected to on the ground that his insanity rendered him incompetent as a witness. The assistant-judge then said:—"I have had a consultation with Mr. Baron Parke, and I confess I look with fear at what may be the ultimate consequences of the law on this subject. This is the course to be adopted:—The witness who is tendered is first to be

examined on the *voir dire*, and then he is to be cross-examined; witnesses may be called on both sides to show his competency or incompetency; and it will then be for the court to judge whether he should be admitted as a witness, and if it is decided in his favour the man may be examined. In fact, the court becomes 'commissioners in lunacy.' Now, whatever might have been the state of his mind before all this takes place, supposing the lunatic even to be competent to give evidence before this examination and cross-examination, I should think that anybody who has visited lunatic asylums, or knows anything about persons of insane mind, would agree with me that the chances are that his mind will be so overbalanced as to render him unfit to give evidence afterwards. When this was argued on a former occasion, a case was mentioned in which a man was acquitted upon a charge of murder on the ground of insanity, and another man (while the lunatic was in prison, subject to Her Majesty's pleasure) was committed to the same prison charged with another murder. He made a confession to the first man, and it was proposed on the part of the Crown to call this man, who was acquitted because he was insane, to give evidence of the confession that the sane man had made to him; and after an argument the learned judge who presided was about to give permission for him to give evidence, when the foreman of the jury said:—"My Lord, I do not know what your Lordship means to decide, but I think it right to tell you that the jury will not believe a word he says." Upon this the witness was not called."

It was then proposed by counsel to call a medical man under whose care the lunatic had been. He would state his competency to give evidence, and he should then put the witness in the box, and the judge would remember that on the last occasion the witness was perfectly conscious of all that was going on, although a little irritable. The assistant judge observed, that it was an important question; for he supposed that now in appeals against lunatic orders, the lunatic himself would be frequently produced as a witness. He would only say, generally speaking, that he hoped no man would ever be brought from any asylum to be examined, without the principal medical officer of that asylum accompanying him, in order to speak to the state of his mind.

Huxley, under whose charge the lunatic was, was then examined, and gave as his opinion that he could speak correctly to *facts* that occurred before he became insane. A witness came forward and spoke to the accuracy of the statements contained in a paper written by the man. The lunatic was then himself called—examined by the judge and cross-examined on the *voir dire*. The assistant judge decided that he might be sworn and admitted to give evidence, which was done, and he proved the facts of the respondent's case. Having heard his examination, the court had no doubt that they ought to believe him; the witness had evinced considerable power of memory.—*Order confirmed.*

In *Reg.* v. *Coggle and others* (Nottingham Lent Ass., 1856), the evidence of a lunatic was received on a trial for felony. The prisoners were charged with highway robbery, and the prosecutor could not clearly speak to their identity. A man witnessed the transaction, and swore positively to two of them. Previous to the trial, however, this man was attacked with insanity, and at the time of the trial

was confined in an asylum. He was produced as a witness, and gave his evidence in a clear and calm manner. It was received, and upon it chiefly the prisoners were convicted. In *Reg.* v. *Slater and Vivian* (C. C. C., September, 1860), the evidence of two lunatics was received, but their statements were uncorroborated, and the jury by their verdict rejected their evidence.

2. Should this Person be Placed under Restraint?

By restraint in a legal sense we are to understand the placing of attendants to watch or control the actions of an alleged lunatic, or his forcible removal from friends or relatives with or without the confinement of his person by physical force. What are the circumstances which will justify a practitioner in applying restraint to the insane? The law has given great power in this respect to members of the medical profession, but, owing to certain abuses, the power has been of late years much restricted by various Acts of the Legislature. Most medico-legal writers agree that we are not justified in ordering restraint except when, from symptoms witnessed by ourselves, we have reason to apprehend that *the lunatic will injure himself or others in person or property*. It is not then sufficient to seek merely for evidence of the existence of some *delusion*, but to determine how far that delusion, if present, affects conduct. Unless the delusion be such as to render it probable that the patient's own interests or those of others may be damaged by his insane conduct, careful superintendence will answer all the purposes of the closest restraint. (For some remarks on this subject, see *Med. Gaz.*, vol. 44, p. 1061.) The act of resorting to severe restraint on all occasions has been justified on the principle that it may tend to the cure of a patient by removing his delusion. In this point of view the subject has reference to medical practice, and not to legal medicine. It may be urged with more plausibility, that by withholding restraint in incipient cases, mischief may be done by the lunatic to himself or others, and that then it will be too late to interfere; but even here proper superintendence will render close confinement unnecessary.

The legal rule for the interference with the liberty of a person, which restraint always implies, has been thus stated by Stephen, J.:—

> There is a normal state in which all human creatures act on the same principles, and the general meaning of sanity is, that the person conducts himself in this normal manner; that he is acquainted with the circumstances by which he is surrounded; that he has objects in view in his actions, and that he regulates his conduct with reference to them, and to the general considerations which affect matters of that class ("General View of the Criminal Law of England," pp. 87 *et seq.*).

It cannot be too strongly impressed on the mind of a medical man that, before he employs the powers conferred upon him by law to confine a person who is said to be mad, he should have well in his mind what lawyers imply by the term "madness" in a practical sense. As defined by Stephen, J., it means *conduct* of a certain character—not, as is usually interpreted by medical men, a certain *disease* of the brain, the existence of which is speculative, but one of the effects of which, if present, is to produce such conduct. In examining an alleged lunatic, with a view of determining whether he should or should not be placed in confinement, his conduct must therefore be

compared with that of other men in a normal state; and here, in order to constitute sane behaviour, we must look for a generic and not for a specific resemblance. Any degree of ignorance, vice, or folly is perfectly consistent with sane conduct in a legal sense. The power of restraint is not intended to be applied to such cases as these; they are properly under certain circumstances amenable to the criminal law. An ignorant, vicious, or foolish man may do a great amount of mischief, but he has a liberty of choice and freedom of action; and if from folly or depravity he selects a bad course, he is not, therefore, insane, but is as much responsible for his actions as a sane man who prefers a good course. Such a man should not be treated as a lunatic nor confined in an asylum under a medical certificate. It may be sometimes difficult to define the line which separates acts of depravity from those of insanity; but in many cases medical men have not been sufficiently cautious in endeavouring to make a distinction. Lawyers look closely to conduct as a ground of interference with personal liberty: the conduct must be such as to be inconsistent with the usual behaviour of a normally sane person placed under similar circumstances.

We must take care not to confound acts depending on violence of temper with those which proceed from unsoundness of mind. A man may have always had a violent temper, subject to occasional fits of aggravation, *e.g.* from disease, as gout, etc.; but this condition must not be mistaken for mental disease. In order to determine whether the acts of a person be due to violent temper or insanity, it will be proper to ascertain what may have been his natural habits. The great feature of insanity is *change of character*—a man who is really insane is different from what he has previously been; but it may be proved of a violent-tempered man that he has always been the same. The greatest abuses of the restraint system have been chiefly observed in respect to monomania, where persons have been forcibly imprisoned and confined in their persons, because they entertained some absurd delusions, over which, however, they had so great a power of control as to render it somewhat difficult even for a shrewd and experienced examiner to detect them. When at last the existence of a delusion has been made apparent, the result has been looked upon as furnishing matter for triumph and exultation; but, as Conolly justly remarks, one point in these cases appears to have been wholly lost sight of, namely,—What possible injury could have resulted to the patient or his friends from the existence of a delusion over which he had such complete control and mastery as to render it a most laborious task to obtain any evidence whatever of its existence? ("Indications of Insanity"). It may be freely admitted that where delusion does exist, there is reason to suppose that the mind must be more or less disordered in all its faculties; but such patients, unless they manifest violence, require only close watching, not a rigorous imprisonment in an asylum. The greatest danger is to be apprehended in all those cases where there is the least power of self-control.

The forcible removal of a person from his home to a lunatic asylum, unless the circumstances are of such a nature as to render immediate interference necessary on the ground of admitted or proved insanity, is unjustifiable in law, and may involve those concerned in the removal in a serious responsibility.

The case of *Nottidge* v. *Ripley* (1849) is in this respect of some interest. A young lady of fortune was clandestinely and violently removed from a place to which she had voluntarily retired; she was examined by two medical witnesses, nominated by those who had thus forcibly removed her, and then closely confined in a lunatic asylum for seventeen months. She was not allowed to communicate in any way with those members of her family who alleged that she was not insane, and who through these tortuous proceedings were for some time unable to discover the retreat of their relative, so as to have the case publicly investigated. At the trial for this abduction, the jury returned a verdict against the persons who were charged with the offence (*Med. Gaz.*, vol. 44, p. 974).

The allegation of insanity was denied, although it was proved that the plaintiff had fallen into the hands of men whose object was obviously to possess themselves of her property, and that, like her sisters, she had adopted some religious notions. If, however, such violent measures are sanctioned before any preliminary inquiry, medical or otherwise, is instituted into the state of a person's mind, and upon the mere opinion of non-medical persons or interested relatives, no person, whether sane or insane, could feel sure of his liberty. This case called forth at the time some criticisms which the reader will do well to peruse. (See *Jour. Psych. Med.*, 1849, p. 564; and 1850, p. 14.)

The editor leaves this case untouched as an excellent illustration of the abuses which there is reason to believe were somewhat gross before the Act of 1890 was passed. Such cases must now be of extreme rarity owing to the rigid enforcement of the Act.

Medical men, acting conscientiously in discharge of their duties, cannot hope to escape harassing and vexatious actions when they are called upon to deal with cases of *delirium tremens*. The peculiarity of this disorder is that if the cause be removed, it may soon disappear, and thus medical evidence may be easily procured to show that a person, at a short period before or after the imposition of restraint, was in a sane state of mind and not in a condition to justify any restraint of personal liberty.

In *Scott* v. *Wakem* (Guildford Sum. Ass., 1862), the defendant, a medical practitioner, was sued for damages in placing under restraint, and without necessity or authority, a man labouring under *delirium tremens*. The plaintiff had been subject to attacks of this disease, and on the day in question the defendant was called in to see him. He found him in an excited state with loaded pistols in his hands, threatening to shoot his wife; and two men were holding him. He was then in a fit of *delirium tremens*, and in a dangerous state. The defendant placed a man in the house to watch him during the night. The usual medical attendant of the family saw the plaintiff on the following day, and then he found him quite sane and sensible, and complaining that he had been kept a prisoner in his own house by order of the defendant. Up to that time he had not seen the plaintiff for several months, and was therefore unable to speak to his condition on the previous night when he was placed under restraint. It was denied that any authority for interference had been given to defendant by the wife, although the evidence that she had authorised the proceedings was very strong. The plaintiff, who recovered next day, brought an action for damages.

The charge of Bramwell, B., in reference to the responsibility of the defendant, was to this effect:—As to the law, if the defendant had made out that the plaintiff was, at the time of the original restraint, a *dangerous lunatic*, in such a state that it was likely *he might do mischief to any one*, he would be justified in putting a restraint upon him, not merely at the moment of the original danger, but until there was

reasonable ground to believe that the danger was over; and this would sustain one of the pleas. Or, again, if the jury were satisfied that the wife of the plaintiff had called in the defendant to cure her husband under a fit of *delirium tremens*, and that he came in to cure him, and left him when he believed he had recovered, then the defendant would be justified in what he had done, supposing that in either case he had done nothing that was not necessary or reasonably proper under the circumstances. Again, if the defendant had been called in on behalf of and for the benefit of the plaintiff, and to cure him under a fit of *delirium tremens*, and when the plaintiff recovered, he himself approved what had been done, that would likewise afford a defence, supposing that nothing more than proper treatment had been adopted. A verdict with a farthing damages was returned, but the medical man was necessarily put to great expense in defending the action. He had acted *bonâ fide*, as medical men ought to do on these occasions, under the belief that there was some imminent danger; but the judge observed, if he had done wrong in imposing restraint, he would not be justified on account of the sincerity of his belief. Had he declined to interfere, and the husband had shot the wife with one of the loaded pistols, he would have been severely censured for not having acted as he did. On one point this case suggests a caution to practitioners. The wife denied that she had given any authority for interference, and thus her evidence conflicted with that of the surgeon. Fortunately the facts were adverse to her statement; but in future cases of this kind, it would be desirable for the medical man to have a written authority for such proceedings, bearing in mind that he does not exceed what is necessary, proper, or usual for the treatment of the person; and on this he must always exercise his own judgment, irrespective of the opinions or suggestions of others. The case of *Symm* v. *Fraser and Andrews* (Q. B., December, 1863), pre-eminently shows that no care or precaution in the performance of these responsible duties will always suffice to prevent a medical man from suffering a large pecuniary loss in order to vindicate his professional character and conduct in reference to the insane.

The plaintiff was a woman who gave way to habits of drinking; she had had an attack of *delirium tremens* two years previously to the trial. The defendants were called in, and attended her professionally. At her own request a nurse and a male attendant were provided for her by a friend, and they stated that they merely followed out the directions of the defendants regarding the plaintiff. She recovered, and after the interval of a year brought an action against the two physicians, not for negligence or ignorance, or want of due care and skill in treatment, but for assaulting and ill-using her, and putting her under personal restraint. It was affirmed that they were wrong-doers *ab initio*, and that there was no reasonable grounds to justify their proceedings. The trial ended in a verdict for the defendants.

The evidence is instructive as showing upon how slender a foundation an action of this kind may rest. There was no doubt that the plaintiff in this case had laboured under *delirium tremens;* every medical man who saw her described her symptoms to be those of this disease—restlessness, irritation, and excitement; loss of sleep, sense of heat of the throat and suffocation, aversion to lie down, a look of terror, and wild suffused eyes; tremor in the limbs and even in the

tongue, distrust and dislike of all around, a disposition to talk incessantly, a thick voice and "rambling way of speaking"; attempts to run out of the house and even to get out of the window, constant craving for drink, violence towards those who withheld it; and, lastly, a tendency to delirious delusions.

If in any case temporary restraint was required, it would have been in this, and the verdict of the jury showed that the defendants were legally justified in resorting to it. One question raised was, whether they were responsible for the acts of the two hired attendants. It was proved that their presence had not been originally authorised by the defendants, but it was suggested that there had been subsequent authorisation of their proceedings. Cockburn, C.J., here drew a distinction between the assumption of authority and the giving of instruction or advice as to what should be done: he also intimated that although nurses and attendants might not be originally appointed by medical men, yet if authority and command were assumed over them in reference to the management of patients, the medical men would be responsible for the personal restraint under which patients were thereby placed. There had been, no doubt, some restraint on personal liberty in this case, but,—Was it or was it not necessary? The jury by their verdict justified the conduct of the physicians, and found that no more restraint had been applied by them than was actually necessary and reasonably required for the proper treatment of the plaintiff.

The 1890 Act prevents such a case as this by Sect. 331, which states that an action must be begun within twelve months after release.

The case of *Hall* v. *Semple* (Q. B., December, 1862) presents, on the other hand, an illustration of the heavy responsibility incurred when proper precautions have not been taken before placing a person under restraint. This was an action against a medical practitioner for illegally causing the plaintiff to be seized and confined in a lunatic asylum. The question, however, mainly turned upon whether due care had or had not been taken in signing the medical certificate by which plaintiff was forcibly carried off to a lunatic asylum.

The evidence given by himself, his daughter, and neighbours established his sanity. The medical man at the asylum could find no indications of insanity about him on his admission, and the two commissioners of lunacy who examined him a few days after his admission ordered his immediate discharge. It was proved that he had led a very unhappy life with his wife—that he was subject to fits of violent passion, and was of a somewhat jealous disposition. After a lengthened trial the jury returned a verdict for the plaintiff with 150*l.* damages

The evidence for the defence failed to prove that the plaintiff was labouring under any insane delusions in a legal or medical sense. The facts of this case show that any passionate ill-tempered man who lived on bad terms with his wife might, by the certificates of the wife and two medical men, be illegally seized and confined as a lunatic. The evidence for the plaintiff, as given by his daughter, proved that there was great provocation on both sides, but no insanity. The regular medical attendant of the plaintiff deposed that he had known him all his life, that he was quite sane, that he himself had been repeatedly asked by the wife to certify that her husband was insane, but he had never seen anything in the plaintiff's conduct to justify him in giving a certificate of insanity. This turned out to be a case in which too

great reliance was placed upon the statements of a woman, who had an interest in, and strong motives for, the removal of her husband from the house. Had a reference been made in the first instance to his usual medical attendant, these proceedings would not have taken place. This, and the more recent actions of Mrs. Weldon against Semple and Winslow, convey a severe caution to members of the medical profession; and also these latter actions convey the further caution that a medical man should not sign a certificate at the request of the proprietor or superintendent of the asylum into which the supposed lunatic is to be admitted, nor receive a fee of unusual amount for signing a certificate.

The case of Mrs. Cathcart throughout 1902 was notorious, and the editor has personal experience of a similar case, a Mrs. White. These women are certainly of "unsound mind," they waste their money and the valuable time of the courts, and are a nuisance to everybody except the lawyers who take their fees, they should certainly be placed under restraint, and would be so placed if medical men were properly protected in signing certificates of lunacy.

In order to provide for the protection of lunatics and the prevention of undue violence or frequency in the application of restraint, the law compels the keepers of asylums to enter in a book a report of each case or of each occasion on which any mechanical restraint is resorted to. An omission to make this entry is a misdemeanour: and at the Maidstone Lent Assizes, 1851, two medical men were convicted and fined for placing patients under restraint without having made the proper entries required by law (*Reg.* v. *Maddock:* see also *Med. Gaz.*, vol. 47, p. 556; and a paper on the "Use and Abuse of Restraint," in the *Jour. Psych. Med.*, 1849, p. 240; *vide* also a case of cruelty, *B. M. J.*, 2, 1900, p. 782).

On this part of the subject it is well to quote one or two of the sections of the Act of 1890, with a few cases. Sect. 315 runs:—

"(1) Every person who, except under the provisions of this Act, receives or detains a lunatic, or alleged lunatic, in an institution for lunatics, or for payment takes charge of, receives to board or lodge, or detains a lunatic or alleged lunatic in an unlicensed house, shall be guilty of a misdemeanour, and in the latter case shall also be liable to a penalty not exceeding fifty pounds.

"(2) Except under the provisions of this Act, it shall not be lawful for any person to receive or detain two or more lunatics in any house unless the house is an institution for lunatics or workhouse.

"(3) Any person who receives or detains two or more lunatics in any house, except as aforesaid, shall be guilty of a misdemeanour."

It is under this section that most of the actions against medical men are now taken, for instance in the *B. M. J.*, September, 1901, p. 749, the following case appears:—

On September 5th, at the Richmond Police Court, Mr. and Mrs. Weston, of Blenheim House Medical and Surgical Home and Nursing Institute, were summoned for receiving and taking charge of lunatics in an uncertified institution. For the prosecution it was argued that an offence was committed whether the defendants were or were not aware of the mental conditions of the patients, who were suffering from general paralysis and therefore from dementia. On the other side, three local practitioners gave evidence that in their opinion the cases in question were not certifiably insane. The Bench convicted, imposing a fine and costs to the amount of 58*l.* 9*s.* 3*d.*

In the same journal, 1, 1900, p. 1133, a similar case, as follows:—

From the reports in the local press we learn that recently in Bournemouth a medical practitioner was summoned, at the instance of the commissioners in lunacy, for "unlawfully, for payment and not under the provisions of the Lunacy Act, 1890, taking charge of . . . a lunatic, in an unlicensed house," from March to October, 1899. According to a local paper, it was stated for the prosecution "that the proceedings were taken under Sect. 315 of the Lunacy Act, 1890, which provided that any person contravening the section was guilty of a misdemeanour. In order to place a person under this restraint the magistrates had to sign a reception order, and this could not be made except on a petition, supported by the certificate of two medical practitioners. It would be alleged in this case that the defendant received into his house a gentleman . . . without having complied with the provisions of the Act." Counsel "understood the case was to be contested by setting up the defence that the patient in question was not a lunatic within the meaning of the Act. The definition clause as to what a lunatic really was set out that an idiot or person of unsound mind was to be so regarded. The case for the prosecution was that this gentleman was a person of unsound mind, as would be proved by the evidence which he should call for the prosecution." In this evidence it was stated that the patient had been in a lunatic hospital for about three and a half months up to the day of being taken care of by the defendant, and whilst at that institution had been distinctly of unsound mind during the whole of the time. He was deluded and suicidal there, it was stated, and was discharged therefrom as "not improved" at the time he passed into the defendant's care. The Bench decided that there was a *primâ facie* case to answer, the defendant was formally charged, and evidence for the defence was taken. The defendant gave evidence that whilst the patient was under his care he "considered him of a perfectly sound mind." Also "he should say that for two months before he came to witness he was not a lunatic." Other medical evidence admitted the patient's unsoundness of mind, yet considered the case not a fit one for certification under the Lunacy Act. The Court adjourned.

On the case being resumed next day the defendant's legal representative, Mr. Hempson, solicitor to the Medical Defence Union, stated that he was bound to say that the evidence called against the defendant "established a technical offence to which he was bound to advise him to plead guilty." Whereupon counsel for the prosecution stated on behalf the commissioners in lunacy that the defendant having pleaded guilty he should not press the penalty, the maximum penalty being 50*l*. He did not suggest impropriety against the defendant, and would go further and say the patient was well treated. The Bench inflicted a fine of 15*l*. and costs.

Again *B. M. J.*, 1, 1900, p. 1322:—

The *Western Mercury* of May 19th contains the account of an action against Dr. Arthur William Llewellyn Jones, of Paignton, by the commissioners of lunacy, for having a person of unsound mind under his paid charge in an unlicensed house. It was not suggested by the prosecution that the house was in any way improperly conducted, or that the patients in it, who were suffering from simple nervousness or depression, were not being excellently treated, but that, in the opinion of an expert who was authorised to visit the house in March last, two of the patients were beyond the border line separating actual insanity from slighter mental disturbance. It seemed that the patient in question had come under the care of Dr. Jones two years previously, when a certificate of mental unsoundness was refused by a justice of the peace. When the expert referred to visited the house the patient had, in his opinion, ceased to be a border-land case, and Dr. Jones's technical offence consisted in the fact that he had neglected to have the patient re-examined, and had thus remained in ignorance of her changed mental state. Had he been aware of it he would, of course, have had her sent to an institution. The Bench ordered payment of 10*l*. 10*s*. by Dr. Jones towards the costs of the action, and two other cases were withdrawn on his paying the court fees.

One more case of a rather different type may be quoted, *vide B. M. J.*, 1902, p. 1191:—

At the North London Police Court proceedings were taken last week by the commissioners in lunacy against the renters of a so-called nursing home in

Holloway. The prosecuting counsel, as reported in the *Standard*, stated that the proceedings were taken under the Lunacy Act, by which any person, except under supervision, who detained a lunatic, or alleged lunatic, for payment in an unlicensed house might be dealt with for misdemeanour, and be liable to a penalty of 50*l*. Two old ladies, among the eleven patients in the house, were suffering from senile dementia. Besides the two defendants a little girl of thirteen years and an assistant were in the house with the eleven patients. Nothing could be more mischievous than that these so-called nursing homes should be allowed to exist, and it was in consequence of irregularities in this direction that the Act was framed and passed. Two lunacy commissioners who visited the house found in one of the rooms, 18ft. by 8ft., four beds and four occupants, two of whom were old ladies between seventy and eighty years of age, clearly incapable of self-control. There were also instruments of restraint, which were rarely used even in certified establishments for the demented, namely, the straight jacket. The two old ladies were paid for—one 22*s*. per week, and one 16*s*. The straight jacket had been used on one of them. She had a fall, which necessitated a surgical bandage; and in order to restrain her from tearing off the bandage the straight jacket was put upon her, and her hands were fastened by straps to either side of the iron bedstead.

In the result the responsible defendant was fined 20*l*., with 5*l*. 5*s*. costs, or three months' imprisonment; and on the second summons 5*l*., or one month's imprisonment, the sentences to be concurrent.

It must be admitted that in such cases as the above, at any rate, where medical men are concerned, the fault chiefly lies with the leaders of the medical profession, who encourage rather than check such breaches of the law (*vide B. M. J.*, 1, 1903, p. 1213, where there is a full discussion on the care of single patients, the harm of certifying, etc.; also *B. M. J.*, 2, 1902, p. 1633, and address by Sir W. Gowers on early cases). It must of course be frankly stated that they do so out of the purest and most high-minded motives, and in their opinion in the best interest of the patients themselves; but the editor cannot help feeling that Professor Clifford Allbutt, in the *B. M. J.* for May 28th, 1904, strikes the truer note when he asks, "if it be true that private care is the best, why have the legislature and the profession been at such pains to establish throughout the country licensed houses with every conceivable aid to recovery that modern knowledge and thought can devise?" Are these to be considered failures? he very pertinently asks, that private homes should be preferred?

The argument chiefly used by Gowers and others is that a stigma remains for ever attached to the victim *and his family* when once he has been certified, and it must be admitted that, in a sense, this is so, but it is not such a public stigma as that attached to police court proceedings, which not infrequently arise when private care is adopted.

A stronger argument against certification seems to lie in the vexatious proceedings, which on recovery, may be brought by a certificated person against the certifier.

On this point the 1890 Act says (Sect. 317):—

"(1) Any person who makes a wilful misstatement of any material fact in any petition, statement of particulars, or reception order under this Act, shall be guilty of a misdemeanour.

"(2) Any person who makes a wilful misstatement of any material fact in any medical or other certificate, or in any statement or report of bodily or mental condition under this Act, shall be guilty of a misdemeanour.

"(3) A prosecution for a misdemeanour under this section shall not

take place except by order of the commissioners, or by the direction of the Attorney-General or the Director of Public Prosecutions.

"Sect. 330.—(1) A person who before the passing of this Act has signed or carried out or done any act with a view to sign or carry out an order purporting to be a reception order, or a medical certificate that a person is of unsound mind, and a person who after the passing of this Act presents a petition for any such order, or signs or carries out, or does any act with a view to sign or carry out an order purporting to be a reception order, or any report or certificate purporting to be a report or certificate under this Act, or does anything in pursuance of this Act, shall not be liable to any civil or criminal proceedings whether on the ground of want of jurisdiction or on any other ground if such person had acted in good faith and with reasonable care.

"(2) If any proceedings are taken against any person for signing or carrying out or doing any act with a view to sign or carry out any such order, report, or certificate, or presenting any such petition as in the preceding sub-section mentioned, or doing anything in pursuance of this Act, such proceedings may, upon summary application to the High Court or a judge thereof, be stayed upon such terms as to costs and otherwise as the court or judge may think fit, if the court or judge is satisfied that there is no reasonable ground for alleging want of good faith or reasonable care.

"Sect. 331.—(1) Any action brought by any person who has been detained as a lunatic against any person for anything done under this Act shall be commenced within twelve months next after the release of the party bringing the action, and shall be laid or brought in the county or borough where the cause of action arose, and not elsewhere.

"(2) If the action is brought in any other county or borough or is not commenced within the time limited for bringing the same, judgment shall be given for the defendant."

It is on the construction to be placed upon the words "good faith and reasonable care" that the verdict will depend, but before this point can even be considered the certifier is placed in a most unpleasant position, and subjected to much worry and expense. It is these sections that make the avoidance of lunacy work advisable for the general practitioner.

It is extremely rarely that "wilful misstatement" is ever charged against a medical man, but carelessness must be held to include a consideration of whether it was advisable to deprive the patient of his liberty at all, and also of the reasons why, *i.e.*, at whose instigation, etc., he was so deprived. There are many vindictive people at large whose minds are really unsound, but whom it would be very hazardous to a medical man to certify.

The following cases point their own moral and strengthen the editor's advice to refuse to certify a lunatic whenever it can be done without dishonour. The first is a reprint of a leader in the *Lancet*, 1, 1900, p. 1809.

A case which was tried this week in London before Mr. Justice Phillimore and a common jury affords a striking example of the dangers which beset a medical man in the performance of his duty—dangers, moreover, which he cannot avoid save by shirking responsibilities not only towards his patients but towards the public at

large. The action was brought by a man named Soper, employed as a coachman, against Dr. J. H. Gibson and Dr. W. M. Young (practising in partnership in Maida Vale) under the following circumstances. The plaintiff consulted Dr. Gibson, who was medical officer of a club of which the plaintiff was a member. He was in a state of great mental depression because his wife had become pregnant, and the responsibilities of the future alarmed him. At the same time, according to the evidence of the two defendants, the wife of the plaintiff informed them that her husband had threatened to murder both her and her children, and that "he had made up his mind to end it." One of the defendants, Dr. Young, enjoyed the peculiar advantage in dealing with such a case of fifteen years' experience in a county asylum. He went to the plaintiff's house and carefully examined him, when the plaintiff said, among other things, that he "heard voices which prevented him from sleeping." Dr. Young, satisfied as to his condition and finding the wife still alarmed, thereupon himself communicated with the relieving officer, who eventually removed the plaintiff to the lunacy ward of the workhouse infirmary. From this institution Soper was, according to his own evidence—which does not appear to have been supported by that of any medical man connected with the workhouse or of any other person—discharged as sane after three days' detention. He brought his action in respect of this detention, alleging that it was due to professional negligence on the part of the defendants that he had been sent to the lunacy ward of the workhouse and claiming as for "false imprisonment." In answer to the plaintiff the two defendants gave their version of what occurred, while Dr. J. F. Woods (medical superintendent of the Hoxton House Asylum) and Mr. W. Rayner (visiting medical officer to the Marylebone Workhouse) gave testimony in corroboration. Their evidence was to the effect that the facts as stated by the defendants showed that the case was one of suicidal mania, and that the defendants had acted most properly and in the plaintiff's interest, while they further explained to the jury the possibility of rapid recovery from acute suicidal mania. Dr. Woods cited an instance that had come under his personal observation in which a patient so affected became sane after two days' confinement. The case, as summed up to the jury by Mr. Justice Phillimore, resolved itself into the answer to a comparatively simple question—whether the two medical gentlemen who were brought to the court as defendants, in coming to the conclusion that the plaintiff was in a dangerous state and in communicating with the relieving officer had acted negligently. To this the jury found the only answer that twelve sensible citizens could find, and their verdict for the defendants relieved Dr. Gibson and Dr. Young of the danger of being mulcted in damages. The verdict was endorsed by a judgment in behalf of the defendants "with costs." This means that of their expenses in defending the suit a portion, cut down to a minimum by the taxing master, will be due to them from the plaintiff, who may or may not be able to pay them.

The medical aspects of the case require no discussion. At the time when Soper left the workhouse infirmary he may have been perfectly sane without this in any way affecting the question of his condition when Dr. Young examined him, as to which we have that gentleman's opinion, and also the evidence of a letter from the plaintiff, in which he wrote: "Fate is against me . . . future happiness and good health seem out of the question for me," clearly showing his melancholic condition. But the story forms another example of the extraordinarily difficult position that is occupied by the medical man in affairs of this sort. Any medical man may at any time be invited to give an opinion upon the question of a man's sanity. If he honestly believes that there is danger in allowing the patient freedom of action he has one duty only, which is to declare that opinion and give effect to that opinion. By doing this he becomes directly responsible for the confinement of the person whom he believes to be insane and may be subjected to the inconvenience, anxiety, and pecuniary loss inseparable from an action at law when the person whom he has certified as a lunatic finds himself at liberty. This is because there exists no means of testing in such an action the genuineness of the plaintiff's claim until it is brought into court with all the costly accompaniments of solicitors, counsel, witnesses, and court fees, and with the further inevitable circumstances, of great consequence to medical men, of waste of time and publicity of an unenviable sort. The public must have a remedy no doubt where the medical man is negligent, and the courts should be open to all who have a just claim to prefer, but there must be some defect in our legal machinery to make the comparatively small and poor class of medical men run such risks for the good of the public. We have, perhaps, the most expensive legal system in the world, and it is one which lays all

persons who are worth attacking open to the attack of anyone, be his claim just or unjust. And if the claim should be unjust the unfortunate defendants have no remedy. The pecuniary loss to the successful defendants in the case of *Soper* v. *Gibson and Young* will be at least 100*l.*, even if the plaintiff is able to pay that proportion of the expenses now due from him in accordance with the verdict. It is a significant fact in this case that the solicitor who represented the plaintiff is the son of the plaintiff's employer; this the wife of the employer admitted when in the witness-box.

The next is reported in the daily papers on February 24th, 1904.

Court of Appeal. Before the Master of the Rolls and Lord Justices Romer and Mathew.

This appeal arose out of an action brought by a farmer's grazier named Pope, of Draughton, Northamptonshire, against several defendants for alleged conspiracy to place and keep him in the Berrywood Asylum as a lunatic whilst he was of sound mind. The defendants were John and Sydney Philip Pope, John Goodman (relieving officer for Brixworth), Dr. Wainright (medical practitioner), Dr. William Harding (medical superintendent at the Berrywood Asylum), and May Pope (the plaintiff's wife). Plaintiff alleged against all the defendants other than Dr. Harding that they maliciously conspired to imprison him in the asylum, and further he alleged against them all, including Dr. Harding, that they had conspired to detain him after getting him in the asylum from September 8th, 1899, to November 10th, 1899. The claim asked for 10,000*l.* damages.

The present appeals were brought, first, by Dr. Wainwright, from a decision of Mr. Justice Bucknill in chambers refusing to stay all further proceedings in the action against him, and second, by the plaintiff, from a second order of the same judge staying all proceedings as against Dr. Harding.

Mr. Lush, K.C., on the first appeal, contended for the plaintiff that a *primâ facie* case had been made out that Dr. Wainwright had not acted *bonâ fide* and with reasonable care.

Lord Justice Romer: Do you really ask us to say that Dr. Wainwright did not really think the man insane?

Mr. Lush: I say there is *primâ facie* evidence to that effect.

Lord Justice Romer: Good gracious!

After further argument, and without calling on Mr. Tindal Atkinson, K.C., to reply,

The Master of the Rolls said plaintiff was unable to point to any technical flaw in the proceedings under the Lunacy Act. The plaintiff was undoubtedly committed to the asylum by a magistrate's order. Everything seemed to be in conformity with Section 16 of the Lunacy Act. There was no shadow of case of any misconduct or malice or want of reasonable care against Dr. Wainwright. The appeal would therefore be allowed, and action stayed as against that defendant, with costs.

The lords justices concurred, and the appeal was accordingly allowed.

Mr. Lush, K.C., did not proceed with the second appeal involving Dr. Harding, and that was dismissed with costs.

For a debate on the subject *vide B. M. J.*, 2, 1900, p. 812, Section of Psychology at the meeting of the Brit. Med. Ass., 1900.

For a case of wrongful detention of a person as an alleged lunatic, *vide B. M. J.*, 2, 1903, p. 1360; it was tried in Dublin in November, 1903, before the Lord Chief Baron and a special jury.

3. HOW CAN AN ALLEGED LUNATIC BE RECEIVED INTO AN ASYLUM?

The Act which specially refers to this subject is the 53 Vict. c. 5, or Lunacy Acts Amendment Bill, 1890. This Act is a consolidation of the statutes on the regulation of the care and treatment of lunatics. Its provisions are very stringent, both with respect to medical men who sign certificates, and those who keep asylums for the reception of lunatics or receive single patients.

Whatever the social position of a patient, and whatever the nature

of his mental derangement, except he be an idiot [*vide* next paragraph], he can be received into an asylum, or other place of authoritative restraint, *only* upon an order. Of this order must be noted:—

1. Its varieties.
2. Who must sign it?
3. What documents must accompany it?
4. How is it to be obtained?

[Idiots and imbeciles are dealt with by a distinct enactment, the Idiots Act, 1886 (49 & 50 Vict. c. 25). They are received into registered hospitals and licensed institutions (not being asylums for lunatics) under *one medical certificate*, which must state that the person to be received is an idiot, or imbecile, *and is capable of receiving benefit from the institution*. This must be accompanied by a *statement of particulars*. No petition or judicial order for reception is necessary. Institutions for idiots and imbeciles are regulated and controlled, like lunatic asylums, by the commissioners of lunacy.]

For the sake of clearness the orders for reception may be tabulated as follows. After the table will be found such comments as seem necessary, with certain definitions.

Orders for Reception.

Variety.	Signed by.	Accompanying Documents.	How obtained.	Remains in Force.
1. Urgency.	Nearest relative or committee of the body.	Statement of particulars. One medical certificate.	By simple wish of the signer of the statement of particulars, on the request of the doctor possibly.	Seven days only.
2. After petition.	Judicial authority.	Statement of particulars. Two medical certificates.	By presenting a petition from relatives.	Apparently for one year. Must then be renewed.
3. After inquisition.	Committee of person or a Master in Lunacy.	Official notice that Inquisition has found patient a lunatic.	By holding formal court of inquiry on request of relatives (or) and demand of patient.	
4. Summary reception order. Non-paupers.	Judicial authority.	Statement of particulars. Two medical certificates.	Information from a parish officer.	
5. Order for a lunatic wandering at large.	A Justice of the Peace or a judicial authority.	Statement of particulars. One medical certificate.	Information from a parish officer.	
6. Order by two commissioners.	Two commissioners in lunacy.	One medical certificate.	On the initiative of the two commissioners.	
7. Reception order for paupers.	Justice of the Peace or judicial authority.	Statement of particulars. One medical certificate.	Information from a parish officer.	

Definitions of Terms used in the Table.

(*a*) "Judicial authority."—This is defined by Sect. 9 of the Act. To be a justice of the peace specially appointed for the purpose, or a judge of county courts, or magistrate, having jurisdiction in the places respectively where the lunatic is. Lists of judicial authorities are published.

(*b*) "Statement of Particulars."—This is the formal document (of which printed copies can always be obtained from the place to which it is proposed to send the person, or from Shaw & Son, Law Stationers, Fetter Lane, London, E.C.), which sets out in a most exactly defined manner, the name and previous history of the patient—in other words, the particulars of the case up to the present attack.

(*c*) Committee[1] of the Person.—When once a person has been formally declared to be a lunatic, his friends may, if they like, or if his circumstances of property, etc., are such as to make it worth while, apply to the Lord Chancellor or a Board of Lunacy (or these officials, on their own responsibility, may appoint) to have one or two Committees appointed: if one, he becomes committee of both body and estate; if two, one is committee of the body, the other of the estate: a committee has sole control of body or estate, or both, subject only to the authority that appointed him, to whom he must make periodical reports.

(*d*) Justices of the Peace.—Local unpaid officials of the Law, almost equivalent to paid magistrates.

(*e*) Masters and Commissioners in Lunacy, *vide* p. 792.

(*f*) Parish officer in the present connection means constable, relieving officer, overseer of a parish, poor law medical officer of a parish, or of a union workhouse.

(*g*) Clear days do not include the day of examination, nor the day of reception, nor that of making an order (? Sundays).

1. **Urgency.**—This naturally means that there is a fear that if the patient be not speedily placed under control some serious damage may result either to the patient or those taking care of him, and this must be made clear in the certificate.

It must be noted that it is the only form of order which does not require the intervention of an officer of the lunacy law; the reason for this, of course, is the necessity for prompt action. To guard against improper use being made of such great powers over the person, the law lays it down (1) that the person signing such order shall be the nearest relative, or if not, that very good reasons shall be given why it is not such person. (2) That the person must be twenty-one years of age, and therefore can be made fully responsible for his actions. (3) That he or she must have seen the patient within two days—a measure of the urgency of the case. The order remains in force seven days only, unless in the meantime the more ordinary means for restraining the patient (petition usually) have been at least initiated, and then it remains in force till completion of the petition.

Inasmuch as it will most frequently be upon the shoulders of a medical man that the responsibility for an urgency order will fall, a few words of advice on such a matter must be added. Urgency can scarcely arise except in connection with acute mania (raving lunacy), and this

[1] This word is spelt like Committĕĕ, but is pronounced Committēē.

is of two kinds. (1) That due to distinctly recoverable causes, such as alcohol, acute pyrenial disease, and lead (*delirium tremens*, or acute drunkenness, lead encephalopathy, etc.). (2) That due to no apparent removable cause—*i.e.* purely mental in origin, so to speak; hence it behoves him to be particularly careful in his endeavours to get at the cause of the outbreak. Remember that to have been once certified as a lunatic inflicts a stigma which can never be wiped out, it remains as a fact for the life of the individual and as a legacy to the children and relatives; exhaust, therefore, every possible chance of simple nursing and watching which the circumstances of the case permit, before taking the serious step of "certifying." These are the cases more especially where the law allows medical men but little protection, and if the patient recovers (as he not infrequently will in *delirium tremens*, etc.), they may have great difficulty in proving that they tried their very best to make milder measures (than certification) answer the purpose of due safety to patient and surroundings. Amongst those who can pay it is the rule that sufficient nursing power can be got, but in the lower classes it is often difficult, and as such people are often vindictive after recovery it is especially in urgency cases I should advise a medical man to get a guarantee from some responsible relative or friend of the patient against all future proceedings and expenses. For further remarks, and one or two cases, *vide* pp. 907 and 909, also *vide B. M. J.*, 1903, 2, p. 944.

2. **Petition.**—This is the most usual event amongst better-class patients when "urgency" is not pleaded. The petition must be (*a*) signed by the nearest relation or a very valid reason given for the fact that someone else has signed it; (*b*) the signer must be twenty-one years old, and (*c*) have seen the patient within fourteen days. It, with the accompanying documents shown in the table, must be presented to a judicial authority, who thereupon considers the allegations of the petition, the statement of particulars, and the evidence of lunacy appearing by the medical certificates, and whether it is necessary for him to see and examine the alleged lunatic; and if he is satisfied that an order may properly be made forthwith, he makes it. If not satisfied, he appoints a time, not more than seven days after the presentation of the petition, for its consideration; and meantime he may make inquiries. He may also visit the alleged lunatic, if not satisfied with the evidence of lunacy appearing on the medical certificates.

When the petition is considered, this is done in private, and no one is allowed to be present except the petitioner, the alleged lunatic (unless the judicial authority shall in his discretion otherwise order), any one person appointed by the lunatic for that purpose, and the persons signing the medical certificates, except with the leave of the judicial authority; and all, except the alleged lunatic and his nominee, are bound to secrecy. The judicial authority may dismiss the petition, giving his reasons to the petitioner in writing, and send a copy to the commissioners; or he may adjourn the consideration for not more than fourteen days; or he may make the *reception order*, on the strength of which the lunatic may be admitted into an asylum, or be received into a house as a single patient.

3. **Inquisition.**—This is the method frequently adopted when a fairly wealthy person is in question. It commonly starts, or rather is

started, by the fact that he is squandering his money in an aimless and reckless manner. Interested relatives or friends at last think it necessary, or advisable, to take some steps to check the progress. It may be that his business is at a standstill, or going to the dogs, when business friends or partners may intervene. The first step is for the interested person to instruct a solicitor. He in turn obtains affidavits from two medical men, that, in their opinion, the person is insane. *N.B.*—These affidavits must be formally drawn up, but they do not require the absolute verbal accuracy of certificates. Armed with these affidavits, the solicitor applies to the Judge in Lunacy for an inquiry.

The Commissioners in Lunacy can also report to the Lord Chancellor that the property of a lunatic is not duly protected, and such a report has the effect of an application for an inquisition. The inquiry is held before a Master in Lunacy, who acts as judge; the patient may be defended by counsel, and be tried by a jury, if he wishes, and he may be present at the inquiry. These last three points are in the discretion of the judge, who may dispense with a jury, and so simplify matters and reduce expense (*vide* later p. 846, where Inquisition is more fully considered).

4. **Summary Reception Orders.**—"Every constable, relieving officer, or overseer of a parish who has knowledge that any person within his district or parish who is not a pauper and not wandering at large is deemed to be a lunatic and is not under proper care and control, or is cruelly treated or neglected by those in charge of him shall within three days give information on oath to a judicial authority." Such judicial authority shall direct two medical practitioners to examine and certify as to his mental state, and shall then proceed as if a petition had been presented to him. The parish officer may be said to simply take the place of a petitioner in ordinary cases.

5. **Lunatics Wandering at Large.**—The parish officer above defined "must apprehend such wanderer, either on his own initiative or by order of the judicial authority," who then acts similarly to petition cases except that only one medical certificate is required. The wanderer may be detained in the workhouse not longer than three days if his welfare or the public safety demands it without the order of a judicial authority, a modified urgency proceeding which must be replaced by proper inquiry by the end of the three days.

6. **By Two Commissioners.**—These gentlemen have considerable powers, and may act on their own initiative when by any means they become aware of the existence of any lunatic not in an institution for lunatics, or not in a workhouse, granting an order with only one medical certificate.

7. **Pauper Lunatics.**—The medical officer of a union is in a sense made by the law the guardian of the mental condition of paupers, and it is his business, when he becomes aware of the existence of a pauper lunatic, to give notice to another parish officer, who then acts as in the case of a lunatic wandering at large. In these cases and in "wandering at large" the statement of particulars must be signed by the relieving officer.

It cannot be too clearly understood that a lunatic cannot be legally detained except by judicial order, and in either a licensed asylum, a licensed hospital, a licensed house, or as a single patient; and that all

lunatics, other than those found lunatic by inquisition, are under the control of the commissioners.

A reception order is not of force for a longer period than one year. It must then be renewed for two years, and after that for three years.

If the lunatic has not been seen by the judicial authority before being detained under a reception order, he is entitled to be seen by a justice, and notice must be given after his reception that he is so entitled, unless the medical officer certifies that such interview would be prejudicial.

It is beyond the scope of this work to enter into the subsequent details as to the treatment and discharge of lunatics; and for these the reader is referred to the Lunacy Acts, 1890 and 1891, statutes which should be in the hands of every medical practitioner for reference.

The Medical Certificate.

The certificate itself runs as follows:—

Certificate of Medical Practitioner.

(53 Vict. c. 5.—Sched. D, Form 8.)

In the matter of

of (*a*)

in the (*b*)

(*c*)

an alleged lunatic.

I, the undersigned,

do hereby certify as follows:—

1. I am a person registered under the Medical Act, 1858, and I am in the actual practice of the medical profession.

2. On the day of 1

at (*d*)

in the (*e*) of (separately from any other practitioner) (*f*) I personally examined the said

and came to the conclusion that

he is (*g*)

and a proper person to be taken charge of and detained under care and treatment.

3. I formed this conclusion on the following grounds, viz.:—

(a) Facts indicating Insanity observed by myself at the time of examination (*h*), viz.:—

(*a*) *Insert residence of patient.*

(*b*) County, city, *or* borough, *as the case may be.*

(*c*) *Insert profession or occupation, if any.*

(*d*) *Insert the place of examination, giving the name of the street, with number or name of house, or should there be no number, the Christian and surname of occupier.*

(*e*) County, city, *or* borough, *as the case may be.*

(*f*) *Omit this where only one certificate is required.*

(*g*) A lunatic, idiot, *or* a person of unsound mind.

(*h*) *If the same or other facts were observed previous to the time of the examination, the certifier is at liberty to subjoin them in a separate paragraph.*

Certificate of Medical Practitioner—contd.

(*i*) *The names and Christian names* (*if known*) *of informants to be given, with their addresses and descriptions.*

(b) Facts communicated by others (*i*), viz.:—

* *Or* not to be.

4. The said
appeared to me to be*
in a fit condition of bodily health to be removed to an asylum, hospital, or licensed house (*k*).

(*k*) *Strike out this clause in case of a patient whose removal is not proposed.*

5. I give this certificate having first read the section of the Act of Parliament printed below.

(Signed)
of (*l*)
Dated this day of 1 .

(*l*) *Insert full postal address.*

An important footnote is thus given—

LUNACY 8.

(53 Vict. c. 5, ss. 4, 11, 16, 28, 29.)

Any person who makes a wilful misstatement of any material fact in any medical or other certificate, or in any statement or report of bodily or mental condition under this Act shall be guilty of a misdemeanour.—*Extract from Section* 317 *of the Lunacy Act*, 1890.

In this certificate there are several points which require to be mentioned specially, as inattention to them has frequently been the cause not only of a return of the certificate for emendation, which is a small but annoying matter (*experto crede*), but also of much more serious trouble to medical men in the shape of actions for infringement of the law and for damages.

1. As a general statement it must be remembered that at the commencement of proceedings the "statement of particulars" and the medical certificates are commonly the sole and only evidence that a judicial authority or a commissioner in lunacy possesses as to the mental condition of a patient, or even as to the existence of such a person, hence strict verbal accuracy in spelling is absolutely essential: it may seem absurd to have a certificate back to insert a final "e," in Smythe for instance, and yet what a serious error such might prove to be, and if proper nouns were permitted to be spelt wrongly where would it be possible to draw the line?

2. Note that when two certificates are required (*a*) each must be made and signed *as the result of an interview made separately from anyone else, i.e.* at a different time: (*b*) the two medical men must not be relatives nor business partners of one another: (*c*) one must if possible be signed by the person's usual medical attendant.

3. Each must be made and signed by a medical practitioner himself, not by his substitute, at least if a substitute does so make and sign it he must be a registered medical practitioner, and must by so making and signing *assume to himself and not to his principal* full responsibility for all he states.

4. In petitions. The medical man who signs the certificate must not be a relative nor business partner of the petitioner.

5. In any and all cases the medical man who signs a certificate of lunacy must not be interested pecuniarily in the place (asylum or private house) to which the lunatic will be consigned, and it is advisable that he should not be in any way related socially or professionally to the medical superintendent.

6. The certifier cannot remain the medical attendant of (or on) the patient; if a medical man wish to become or to remain the medical attendant of a lunatic, he must get some independent medical man to certify the case.

7. In commissions of inquiry the evidence of a medical witness is, of course, of a similar nature to that which would be written in a certificate, but is obtained on the compulsion usual in courts of law, and is therefore privileged, and therefore so long as the facts are correct a witness may advance under these circumstances any theories he likes without fear of the law of libel or of any action by the person on trial, but it is scarcely necessary to say that if such theories are to have any weight they must be strong enough to bear very close cross-examination, and must be very obviously unbiassed by any personal feeling or motive.

8. As regards the actual basis of the certificate, the "facts." A medical practitioner must not be too ready to lend himself to the signing of certificates for the imprisonment of persons who may be labouring under harmless delusions. In violent mania, or in monomania with a homicidal or a suicidal propensity, there can be no doubt of the propriety of applying some degree of restraint, for here the necessity is imminent. If a remarkable change has suddenly taken place in the character of a patient, if he has become irritable, outrageous, or threatened personal violence to any one, or if he has recklessly endangered the interests of himself and family, he is undoubtedly a fit subject for restraint. The more he approaches to this condition, the less difficulty we shall have in coming to a decision, and in a really doubtful instance there will be no impropriety in employing restraint; since, although the person is thereby deprived of liberty, it is better that this should happen than that he or his friends should incur the risk of suffering severely by his insane conduct (*vide supra*, p. 824).

Every medical practitioner signing a certificate of insanity is required to specify the facts upon which his opinion is formed, and whether such facts are derived from his own observation or from the information of any other person. Medical practitioners have had some difficulty in performing this duty, *i.e.* in assigning the fact or facts upon which their judgment of the insanity of a person is based.

Millar has shown how little the words, "Facts indicating insanity observed by myself," are appreciated or even understood by many medical men, who are legally empowered as registered members of the profession to sign these certificates. The facts are frequently stated in a loose and careless manner, showing a complete misapprehension of their meaning. What is really required by the law is a statement of facts observed or witnessed by the medical man himself, which would carry conviction to the mind of any non-professional man reading it, that the person to whom it referred was of unsound mind. A medical man should in all cases avoid giving as a fact indicating

insanity, any delusion which might in reality have some foundation in truth. With respect to the second requirement of the statute, namely, "Other facts (if any) indicating insanity communicated by others," it may be observed that, although these do not supersede the facts observed by the medical man himself, they are of great importance in throwing light upon the propensities or habits of the patient, and thus serve as a guide for treatment (*op. cit.*, p. 79). A medical man must take care to draw a clear distinction between the facts observed by himself and the facts communicated to him by others, and avoid such vague expressions as that he "thinks" and "believes," etc.

Millar gives a series of "facts" taken from certificates of patients who were brought to the asylum of which he was superintendent. Some, he remarks, afford no evidence whatever that the person to whom they refer is of unsound mind; others are vague and irrelevant; and, lastly, there are some which are quite satisfactory:—

"1. *Facts which Offer no Evidence of Insanity.*—(In reference to these certificates, it may be remarked that they were all sent back to be amended, as the patients could not be received under them):—

"Refuses to take her medicine, and resists in every way; closes her teeth, and threatens to strike any one near her; obliged to use the strait-waistcoat."

"Violent in her temper and very abusive."

"She refuses to answer questions as to where she lives; her memory is much impaired; she is weak, and has an appearance of imbecility."

"He is very bad-tempered; and imagines he is coming into some property."

"Look and manner indicate imbecility; memory very defective; can give but little account of himself; does not know his own age."

"He has a suspicious, dangerous, suicidal eye; he evidences in his appearance cerebral mischief."

"Great excitability from religious delusions."

"Moody irritable temperament, and of weak memory in many particulars."

"General conduct for the last three months; sleeping on the coffin of his wife three months ago; general obstinacy and delusions of various kinds; extreme excitement at times; this day he appears much more rational and quiet."

"She has an insane appearance, and wanders about apparently without object; she is anasarcous."

"An insane appearance; loss of memory; she is subject to epilepsy; has been under my care for some time, and has never until yesterday been in any way violent or troublesome."

"He imagines he has no other clothes to put on besides his present habiliments; he imagines he is about to come into some property.

"2. *Vague and Irrelevant Facts.*—Obstinate; has the manner and appearance of an insane person; complained of her head; refused her food, and would not go downstairs; melancholy."

"She states she has a child which is dead, but which is now living."

"She is suspicious of her husband without cause; says he keeps bad company; she is most irritable and jealous, and takes stimulating drinks to a dangerous and exciting extent."

"His countenance is expressive of great anxiety and restlessness; his pulse exceedingly feeble—he appears to have been bled; he says all the public-houses in London belong to him; also that he is going to marry the Queen."

"She is very good-tempered, but day and night she talks almost incessantly, occasionally sings; she says she comes from Otaheite, and relates stories of those around her doing absurd things."

"This patient has old bronchitis, and is very weak; her memory is almost lost; she believes her mother is still alive, and gives me messages to people long since dead; at times she is noisy and excitable, and is generally very loquacious."

"His unreasonable and inconsistent conversation."

"That, being a married woman recently confined of her first child, she persists that she is not married, and is under delusions that she has committed some great sin; she is melancholy, seldom speaking when spoken to, and almost totally refusing her food; and constantly attempting to beat herself, requiring to be kept under restraint."

It turned out that this woman was really not married.

"He has imperfect sight, good hearing, and taste; he is unable to speak; his gait is ape-like; and the skull-bones seem to have fallen together, from the want of cerebral development. He will occasionally slap his face and strike his hands, and sometimes make a howling noise."

"3. *Good Facts.*—That she is in a state of restlessness and excitement, and generally incoherent in her conversation and conduct. Thus, stating her place of abode to be twenty-five miles from Hertford, when it is only two miles; that her doctor resides in Fore Street, Cripplegate, and goes to Hertford to see her every day, when, in fact, he resides in Hertford and sees her only now and then; that her uncle farms 3,000 acres of land in one farm besides several others, when, in fact, he farms only 150 acres; and that all her conversation is without rational sequence of ideas, passing rapidly from one thing to another; that, whilst I was conversing with her, she began to undress herself, apparently without purpose."

"She states that she is a lost person, and without hope of forgiveness; that she will be taken to prison, and die a miserable death; that the devil whispers in her ear that she has committed the unpardonable sin."

"From desperate attempts at self-destruction, from groundless fears of poverty."

"From the delusion that all the food brought to her is poisoned, and refusing to take any; that she has cats and dogs in her stomach and about her room, and expressing a desire to commit suicide."

"Great taciturnity; complete seclusion from society; aversion to cleanliness, and having no fixed ideas about anything; wandering about the streets at improper hours."

"*Of an Old Man, aged eighty-three.*—Mental and moral incapacity, and perverted feeling and views with regard to women and female children; personal habits uncleanly and slothful."

"Inability to hold any rational conversation; her manner and conduct are totally at variance with her usual habits."

"He states that he is a Prince of France; that he possesses a

palace, and has recently had two fortunes left him—one of 400,000*l.*, the other of 600,000*l.*; that he is going to Liverpool, a distance of 160 miles, with a horse and cart, that will take him four hours to go, and eight to return."

"From his being subject to epileptic attacks, followed by incoherence, and occasionally uncontrollable violence."

"He is incapable of judging between right and wrong; and is in such a state of mental debility, that he does not recognise persons who are closely related to him, and who have recently been with him."

"Violent excitement, with rapid, incoherent, and obscene speech."

"That she is outrageous in her conduct and incoherent in her statements; when questioning her upon rational subjects, she immediately became very violent, rushing downstairs in a state almost of nudity, and locking herself up in the coal-cellar."

"He fancies himself to be a large shipowner, and offers those about him the command of his ships; he is also incoherent and violent."

"A general restlessness and perturbed manner. When asked to sit down, he says, 'I can't sit down;' to put out his tongue, 'I can't put out my tongue;' if he eats his food, he replies, 'he can't eat food; he can't swallow; that he has no throat; that he never eats anything; that his feet are broken, and his hips are broken—that he is altogether broken.' He lies in bed, and when asked to get up, he says, 'I can't get up;'—all of which sayings are delusions, and not true. He does get up, and he does sit down; and he does eat, drink, and sleep; and his feet are not broken; nor has he received any injury to his ribs or hips" (Millar, *op. cit.*, pp. 80—86).

As every medical certificate, although accepted by the commissioners of lunacy, may become at a future time a subject for close and hostile criticism in court, a medical practitioner should be fully prepared to justify the use of any terms which he has employed. It is therefore desirable that he should studiously avoid any misstatement or exaggeration of the symptoms.

No professional man is compelled to take upon himself the responsible duty of signing certificates of insanity; but if he does undertake it, he must perform it with reasonable care and ordinary skill. If he certifies that a person is labouring under delusions, he must take care that he understands the meaning of the term; and, admitting that he is correct in believing from his own observation that they exist in the mind of the patient, it must be remembered that, in order to justify restraint or imprisonment in an asylum, the law looks always to the influence of these delusions upon conduct.

We may perhaps better here than elsewhere define the three terms, "Illusion," "Hallucination," and "Delusion," without using one or the other of which it is very difficult for a medical witness to go very far. The most commonly accepted definitions of them are:—

(*a*) An **illusion** is a false perception of an external stimulus.

(*b*) A **hallucination** is a perception without any external stimulus to cause it, a subjective phenomenon entirely.

(*c*) A **delusion** is a perversion of the judgment, required to be obviously erroneous and persistent if it is to constitute either (*a*) or (*b*) a real test of lunacy. Delusions are common enough in the sane,

but in them can be dispersed by presentation of fresh facts or by powers of reason.

These definitions would be more satisfactory if only those in authority on psychology would but agree precisely upon them: as the authorities, however, do not precisely agree in their meanings of the terms, it is well for the medical witness to try and avoid the terms, and if he has been led into using one of them, and is suffering for it in cross-examination, let him repeat the facts he has observed and offer counsel his choice of a term to use!

To illustrate the position in plainer language, take a case of *delirium tremens*. The beetles, rats and mice the patient sees running over the bed are hallucinations; if his own little dog comes into the room and he thinks he is the devil come to remove him (the patient) this is an illusion; when the nurse, by sweeping the bed, or calling the dog to be fondled by his master, tries to convince the patient that there is nothing on the quilt, and that "the devil" is his own pet, and *he yet persists in his former beliefs*, this persistence constitutes a delusion of such nature and degree as proves (at least temporary) insanity; if counsel doubts or disputes your choice of a term, tell him about the beetles and the devil and give him his own choice of expression.

It is but seldom nowadays that actions are brought against medical men on the specific charge of filling in false certificates, or even of filling them in carelessly (*vide Hall* v. *Semple*, Q. B. D., 1862), but the ease with which such actions can be commenced, urges the editor to advise a medical man, as far as possible, to avoid being mixed up in such cases. This he can do by refusing to give a lunacy certificate. He can very well leave such cases to medical officers of the law. The statute of 1890 (Sect. 330) has somewhat improved the position of medical men in this respect by giving power to a judge, on proper application, to summarily quash such actions, and also by laying it down that an action, such as this, must be brought within twelve months of the act of signing.

In the case referred to (*Hall* v. *Semple*) the following observations occur in the charge:—"The true ground of complaint is the negligence of the defendant and the want of due care in the discharge of the duty thrown upon him; and I think that if a person assumes the duty of a medical man under this statute, and signs a certificate of insanity which is untrue, without making the proper examination or inquiries which the circumstances of the case would require from a medical man using proper care and skill in such a matter—if he states that which is untrue, and damage ensues to the party thereby, he is liable to an action, and it is to that I desire to direct your particular attention. In point of law, if a medical man assumes under this statute the duty of signing such a certificate, without making, and by reason of his not making, a due and proper examination and such inquiries as are necessary, and which a medical man under such circumstances ought to make, and is called on to make, not in the exercise of the extremest possible care but in the exercise of ordinary care, so that he is guilty of culpable negligence, and damage ensue, then an action will lie, although there has been no spiteful or improper motive, and although the certificate is not false to his knowledge."

The jury found a verdict for the plaintiff—that the certificate was

untrue in effect, and that it had been signed without proper examination and inquiries and without probable cause.

These remarks are as applicable under the 1890 statute as they were before.

De Lunatico Inquirendo.

When a person, from mental incompetency, is liable to be imposed upon by others, or is guilty of foolish and extravagant acts whereby his property is damaged, an inquisition may be instituted by the judge in lunacy; and the inquiry may be carried out by the masters either alone or with other appointed persons; or an inquisition may be held, with or without a jury, to determine the competency or incompetency of an alleged lunatic. The writ is well known under the name of "*de lunatico inquirendo.*" Before it can be issued it is necessary, among other matters, that there should be affidavits made by two or three physicians or surgeons, certifying to the insanity of the party. It has been already explained that the object of the commission is to determine whether the incapacity to manage affairs is owing to some *mental* defect or disorder, and not merely to want of education or bodily infirmity—otherwise many wealthy minors and infirm persons might be improperly deprived of the control of their property.

A master in lunacy, who is holding an inquisition of lunacy, has power to order a writ of attachment to issue against an alleged lunatic for the purpose of enforcing his attendance; but in ordinary cases he ought to refer the matter to the Court of Lunacy. (*Re Bathe*, [1892] 1 Ch. 459. Court of Appeal—Lunatic—Writ of Attachment—Compulsory Order for Examination—Jurisdiction of Master in Lunacy—Lunacy Act, 1890, s. 49, sub-s. 2—Lunacy Act, 1891, s. 26, sched.)

If a verdict of "lunacy proven" be brought in, it by no means follows that the lunatic must be deprived of his liberty.

In *Re Smith* (1862) an order for a jury was issued to try the question of sanity or insanity, and in affirming the order Knight Bruce, L.J., enunciated the following proposition: "It is desirable to remove the idea but too generally entertained by persons (common persons) in different stations of life, that the finding by a jury that a person is of unsound mind, necessarily involves an interference with his personal freedom: it does not. The court places no further restraint upon a lunatic than is necessary for his protection, and I would refer to the fact that there are several lunatics living under the protection of the court who reside in their own houses with large establishments." It is to be hoped, nevertheless, that the court would interfere were the lunatic dangerous to *others*.

The proceedings in the case of chancery lunatics are now much simplified, and the cost of an inquisition lessened by the statute of 1890, as a jury can be dispensed with, and the inquisition held by the masters in lunacy.

One source of difficulty on these occasions is that selected medical witnesses are allowed to be summoned by both parties. It has been well remarked, that a man even unknown to himself, with the purest intentions and the most perfect rectitude, will insensibly lean to the side on which he has been consulted or employed ("Pagan," p. 301). The public are apt to infer, from such conflicting opinions emanating from men of apparently equal experience, that the difference cannot depend essentially on the *medical* facts of a case, and that the

question might as well or even better be determined by non-professional persons.

Examination of Alleged Lunatics.—To determine whether a person is or is not a fit subject for interdiction or the deprivation of civil rights, it is necessary to bear in mind that it is not enough to show there is *delusion*, as in the slighter cases of monomania; but we are bound to ascertain how far the delusion affects his judgment, so as to prevent him, like other men, from managing his affairs with provident care and propriety.

Drawing the line between soundness and unsoundness of mind in cases of imbecility is one of the most difficult questions of medical science.

In conducting the examination of an alleged lunatic, we should compare his mind as it is with what it has been; and if it be a case of supposed imbecility, a proper regard must be had to age, society, education, and general conduct (*vide ante*, p. 793, "Definition of Lunacy"). We should also consider whether the person has been treated by his friends and relations as a lunatic or an imbecile prior to the issuing of the commission.

One of the best tests of mental capacity will be found in determining the degree to which, with ordinary opportunities, a person has shown himself capable of being instructed; but too high a standard must not be assumed as a test of capacity. The mind of an alleged imbecile should not be compared with the most perfect mind, but with that of another person of average capacity, of the same age and station in society, and who has enjoyed like opportunities of instruction. It would be difficult to find two sane persons who were exactly equal in mental power: in some, one faculty is prominently developed, in others another. All that we have to look for in these cases of alleged unsoundness is an average degree of intellectual development, so as to qualify the person for performing the duties of his station. To win the confidence of an alleged lunatic for the purpose of examination, we should not treat his observations or delusions with levity, but rather seriously sympathise with him in his troubles; we should listen attentively to all he has to say, for his suspicions will be excited by many questions being put to him. If we cannot agree with his conclusions, we should not contradict him abruptly, but endeavour to draw him out by asking for some corroborative evidence of his statements. Before visiting the patient, we should make ourselves thoroughly acquainted with every particular connected with his history and condition, and treat him as much like a sane person as possible. The insane are exceedingly suspicious, and quick to detect any deceit practised on them. They are also jealous of the intrusion of strangers, and, unless great tact is employed, will look upon a medical man as an enemy, and treat him accordingly. The patient should be informed that his perceptions are merely the result of natural disease; it is useless to tell him that he is under a delusion when his perceptions, although sometimes exaggerated, are too real to be doubted.

The conflicting medical evidence given on inquisitions as to lunacy is in great part to be ascribed to the fact, that the whole of the mind of the person is not fairly examined. One physician tests one faculty, another another; each has his own theory of insanity, and each his

standard of competency. The witnesses in support of the inquisition do not go so much to test the actual state of mind of the person, as to discover what they deem proofs of insanity; those against the inquisition take an opposite course—they look only for some proofs of soundness. It cannot therefore happen otherwise than that different conclusions should be drawn under such different modes of investigation.

In giving evidence on inquisitions as to lunacy, a witness must take care not to allow himself to be embarrassed by medical or legal definitions of insanity. The malady may not assume the form of lunacy or idiocy, in a strictly legal view—nor of mania, monomania, dementia, nor idiocy, in a strictly medical view; but still it may be a case of *such mental disorder* as to create *an incapacity for managing affairs*. This is the point to which a medical examiner has to direct his attention. Cases of imbecility present the greatest difficulty, and create the greatest conflict of opinion among medical witnesses. Imbecility strictly implies a weak or feeble mind, and the term is properly applied to one who has an intellect below par or below the normal average. The vagueness of these terms shows how difficult it is to draw a clear distinction between legal sanity and that degree of mental weakness implied by imbecility which would justify interdiction. Insanity in the common acceptation of the term cannot be proved in these cases: there will be no evidence of delusion, and there may be such an amount of self-control as to enable a person to maintain a conversation. Memory, judgment, and other faculties, although weak, are still present in a greater or less degree; and from one or two interviews only, an examiner might be disposed to pronounce the person of sound mind and competent to manage his own affairs. There is a wide field for argument here, for it may be said with some truth, in a defence, "that the doctors cannot put their fingers on a single point indicative of insanity." In short, each fact specified by them may be frittered away by the remark that every one must have known some person who had either a bad memory or a weak judgment, who squandered money, who wasted it on unworthy objects, who hoarded it and refused to pay just debts, or who lost it in foolish speculations, etc. All this may be true, and yet the person in question may be legally of unsound mind.

Evidence of Insanity from Handwriting.—There is on these occasions a method of testing the state of mind which was suggested by Conolly—namely, by inducing the patient to express his thoughts in writing, as in a letter addressed either to his physician or to some confidential friend. This plan would probably often succeed in developing the existence of a latent delusion, when an examination would wholly fail; the patient would not be led to suspect that he was being subjected to an examination for a hostile purpose. The current of his thoughts would be uninfluenced by the suspicion, that the act of writing was to test the state of his mind; and as no man can long write in a connected manner who does not think collectedly, so we may expect to find ample evidence whether a delusion exists or not.

In idiocy there is no capacity for writing. In dementia, as there is no memory, it commonly happens that the same word or words are written over and over again. No person in a state of confirmed dementia can write a connected sentence, because before the last part

of the sentence is completed the first is forgotten. In imbecility we may meet with every variety of mental defect, but the state of the mind is generally indicated by the expression of the thoughts in writing.

Marcé has remarked that the method of writing is nearly the only plan which can be adopted when the person refuses to answer questions, and maintains a state of taciturnity for days or weeks. If furnished with writing materials, lunatics will often, in secret, voluntarily draw up petitions, addresses, or wills, which will reveal their real state of mind. In feigned insanity this mode of investigation is of great importance.

In 1861 the case of Mr. W. F. Windham was tried as follows :—

Fifteen of the relatives of this gentleman petitioned for an inquiry into his state of mind, on the ground that he laboured under congenital deficiency of intellect; and on the other side it was argued in favour of Windham that his mental condition, if below the normal standard, was entirely owing to the results of a neglected education. The inquiry lasted thirty-three days, during which 140 witnesses were examined—namely, fifty on the part of the petitioners, and ninety in favour of Windham. There was conflicting evidence, medical and general. There was no proof of the want of the opportunity of education, but strong reason to believe that the alleged imbecile had not made use, like other boys of his age, of the advantages which he had enjoyed. He had been sent to Eton, but had derived but little benefit from his connection with that school. It seems to have been admitted that as a boy he was wholly unlike other boys, and when he attained his majority in August, 1861, his conduct was extravagant, wild, and inconsistent with his social position. At the same time he was not entirely deficient in business matters; for it was proved that his uncle, one of the petitioners, had shortly before negotiated with him for the sale of a piece of land of the value of 1,000*l.*, thereby admitting his capacity to transact business. The evidence received on this occasion was allowed to extend to the whole of his life, and it may be observed that in cases of alleged imbecility it is not possible, without doing injustice, to prevent the reception of evidence from a long antecedent date. Imbecility is a congenital deficiency of mental power, and it is therefore always material to show whether this has or has not existed from youth upwards.

A large mass of testimony, much of which was irrelevant, was thereby introduced into the case. The facts mainly relied on in support of Windham's incompetency were—that he was very extravagant in purchasing articles which he did not require, at exorbitant prices and in unnecessary quantities, and he thus incurred debts of enormous amount without any reasonable prospect of being able to pay them off; that he was guilty of gross indecency of language and conduct in public places, and even in the presence of ladies he appeared to have no sense of shame; that he habitually associated with low characters and prostitutes, and three weeks after he had attained his majority he married a woman of disreputable character, who up to the night before her marriage had been the paramour of one of his associates; that having infected this woman with venereal disease, he gave her presents in jewellery amounting to from 12,000*l.* to 14,000*l.*, and settled upon her 800*l.* per annum for life, as a compensation for his misconduct—his income at this time not being more than 1,250*l.* per annum. Although this woman after her marriage had cohabited with another man, yet he (Windham) had again lived with her, and had manifested no sense of shame in reference to this act of condonation of adultery. He was in the habit of dressing himself and acting, sometimes as a detective officer, then as a railway guard, and on one occasion he locked in a railway carriage the woman whom he had married and the man with whom she had previously cohabited. The petitioners looked upon these acts as indications of unsoundness of mind and incompetency to manage his affairs with reasonable care and propriety; the ninety witnesses in favour of Windham regarded them simply as playful eccentricities and boyish tricks. The medical evidence for the petitioners chiefly rested upon Winslow and Mayo: they were appointed as examiners by the lords justices, and Bright was associated with them as assessor. Nothing could be more fair than the mode of testing the mental condition of the alleged imbecile. There were two interviews, lasting altogether three hours.

Numerous questions were put on a variety of subjects, but it was found very difficult to induce Windham to concentrato his thoughts ou any one point. Winslow considered him to be in a state of mental imbecility, and that he was a person of unsound mind, incapable of managing himsolf or his affairs. The degree of mental unsoundness under which he laboured was not inconsistent with a capacity to write letters, to acquire a certaiu amount of classical knowledge or the ordinary rnles of arithmetic, to sottle small accounts, and to inako purchases to a limited exteut. The usual stock objectiou was taken to this opiniou—namely, that the witness could not say whero sanity ends and insanity begins. Winslow admitted that it was impossible to traco the line of demarcation. At the same time mental unsoundness might be appreciated; it implied such a degree of mental deficiency as would incapacitate a person for the managemeut of himself and his affairs. Inability to command the attention and incapacity of sustained thought were symptoms of the peculiar kind of imbecility under which Windham laboured. Deadness to a sense of moral obligations is also frequently observed in such cases. Mayo in his evidence concurred with Winslow. He considered that Windham had a weak and childish intellect, and an impure mind; he manifested utter shamelessness respecting the circumstances of his marriage and his conduct before and afterwards. Southey, also appointed by the lords justices to examine Windham, came to the conclusion that he was labouring under imbecility and was of unsound mind. His conversatiou was more rational thau his conduct, aud from couversation alone he could not have come to the conclusion that he was of unsound mind. Further, judging from his private interviews with him, he considered him to be a persou of weak intellect, but he "should hesitate to express the opiniou that he was not capable of managing himself or his affairs."

On the other side, Tuke examined Windham, and came to the conclusion—1st from his powers of observation; 2nd, from the manner in which he instructed his solicitors for his defence; and 3rd, from his delicacy in conversation wheu there was an opportunity of introducing indelicate remarks—that ho was not imbecile. He also thought that his sanity was perfectly consistent with his getting into debt to the amount of 25,000*l.* or 30,000*l.* and giving 14,000*l.* worth of jewelry to his wife. Seymour, a commissioner of lunacy for eight years, examined Windham, and was with him a sufficient time to enable him to form an opinion of the state of his mind, and ho saw nothing to justify him in saying that he was of unsound mind. He was certainly not a lunatic, and he was under no delusiou. He was capablo of managiug himself and his affairs, but the inquiry would have a considerable effect in improving him. Hancock stated that during his interview with Windham he neither saw nor heard anything which would justify him in arriving at any other conclusion thau that he was of sound mind. Hood had had several interviews with him, and considered him to be of sound mind and competent to manage his own affairs. Sutherland, as the result of an examination and from the evidence heard iu court, considered Windham to be of sound mind; there were no symptoms of congenital imbecility or of idiocy about him. In cases of imbecility he always went by practical tests, and in his opinion an imbecile should be incoherent in language and inattentive to the calls of nature. "There was no incoherency iu Mr. Windham's conversation." He was rather below the average in point of intellect, but he did not at all approach the line where imbecility began. No amount of eccentricity should be received as evidence of insanity unless it is accompanied by some unmistakable proof of unsoundness. Conolly examined him on two occasions, and believed him to be of sound mind; therc was not one single indication of unsoundncss about him. No medical man could sign a certificate of iusanity in his case, and uo keeper of an asylum would think of taking him as an inmate.

The master in lunacy, iu addressing the jury, said:—"The question to be decided was not whether Mr. Windham was absolutely insane, but whether there was such imbecility of mind, not amounting to actual insanity, as to render him unable to act with auy proper or provident discretion, or to render him liable to be robbed by any one. The broad question was whether he was of sufficiently sound mind to be entrusted with the management of himself and his affairs. Mere weakness of character, mere liability to impulse good or bad, mere imprudence, recklessness, and eccentricity, to which might be added immorality, did not constitute unsoundness of mind, unless, iu looking fairly at the whole of tho evidenco, there was good reason to refer them to a morbid condition of the intellect. They might furuish evidence of unsoundness, but they did not constitute it."

Windham then underwent a private examination before the jury, and it is said that he gave proper answers to the various questions put to him. The jury, by a majority of fifteen to eight, returned the following verdict—"That Mr. Windham is of sound mind and capable of taking care of himself and his affairs." After the verdict had been returned pronouncing him sane and competent, he was guilty of other eccentric acts, exhausted a splendid fortune and became a bankrupt; showing that, whatever legal soundness of mind he might possess in the opinion of two-thirds of the jury, he practically did not evince that capacity which they declared him to possess of taking care of himself or his affairs.

A large section of the public joined in the view prominently put forward at the inquiry that this unfortunate young man had been made the victim of a charge the most cruel, unjust, and unjustifiable. Insanity, it was urged, in the ordinary acceptation of the word, did not exist in his case. There were no illusions, hallucinations, or delusions; but as these are never met with in the form of unsoundness imputed to Mr. Windham, namely imbecility, their absence proved nothing for or against the existence of imbecility or weakness of mind. But what test is there for imbecility except conduct and conversation? There was no incoherency of language, but there was strong evidence of habits such as we do not meet with among men of really reasonable minds; but opinions were divided on the question, whether these indicated unsoundness of mind, or a mixture of eccentricity and moral depravity from deficient education. A majority of the jury took the latter view; and Lord Chelmsford, in commenting upon this verdict in the House of Lords (March, 1862), said:—"The law as laid down by Lord Lyndhurst applied to cases short of insanity, but they must be cases of unsoundness of mind; and mere extravagance or follies, which indicated imbecility, would not be sufficient unless the imbecility amounted to unsoundness of mind." The legal test of the existence of this state of mind, we are told, is "conduct." A lawyer means by madness "conduct of a certain character," while a physician means by it "a certain disease one of the effects of which is to produce such conduct" (Stephen's "Crim. Law of England," p. 87). The whole evidence against Windham bore upon conduct, and from the verdict we learn what sort of conduct does *not* constitute madness in a legal sense. The marrying of a woman of disreputable character, —the squandering upon her of 14,000*l.* in jewelry, and settling upon her 800*l.* per annum, with other extravagant acts of a similar kind, do not constitute "conduct of a certain character" sufficient to render a man *non compos mentis* in the eye of the law; but if these acts evince soundness of mind and a competency to manage affairs, what are the acts which indicate unsoundness or incompetency? On the other hand, we are told that the physician looks to the existence of a certain disease; but a physician can know nothing about the existence of disease of the brain during life in any case of imbecility, except in so far as its effects may be manifested by conduct. We therefore come round to the legal test of "conduct," which in Windham's case was considered to be quite consistent with the provident management of a large estate and a splendid fortune. That the legal test was here a failure in affording protection from wastefulness is proved by the result.

This case drew down upon the medical profession some severe comments; and among others the Earl of Shaftesbury, who had had considerable experience in the working of the law of lunacy, made the following observations:—"He did not know that medical gentlemen (he said it with all respect), unless they had made insanity their special study, were more qualified to judge of the soundness or unsoundness of mind than any person of common sense and practical knowledge of the world. Mere opinions and scientific speculations ought no longer to be adduced in the courts as testimony. Whatever evidence was given by a medical man should be facts and judgment based on these facts."

Inquisitions may be superseded, but the evidence must then be as strongly in favour of sanity as it was before in favour of insanity.

The great caution shown in superseding inquisitions will be evident from the following case:—

In *Re Blackmore* (December, 1862) a petition for a *supersedeas* of a commission of lunacy was presented to the lords justices, and was supported by the evidence of Sutherland and Winslow. Turner, L.J., observed:—"There is no more painful duty in reference to lunatics than to decide whether persons against whom a commission has been issued are so far recovered as to justify the superseding of the

commission. It may be that the recovery is apparently perfect so long as the restraint is continued, but the moment the restraint is removed the disease reappears. It must be a subject of anxious consideration whether the recovery will continue when the restraint is removed. Notwithstanding the implicit confidence which the court places in the medical reports produced, and the favourable impression conveyed by the personal interviews which the commissioner has had with the petitioner, the court feel that they ought not to go so far as to supersede the commission, but that it is their duty to see what will be the effect of removing the restraint, and whether the removal of it will be attended with a recurrence of the disease. This course is one which is borne out by both reason and authority. The authorities in favour of it are the judgments of Lord King in Lord Ferrer's case in 1730; Lord Hardwicke, in Sir William Brooke's case, in 1737; Lord Loughborough, in Errington's case, in 1798; Lord Eldon, in Stock's case, in 1813; and Lords Lyndhurst and Cottenham, in Dyce Sombre's case, in 1844 and 1847. After much reflection on the subject I have come to the conclusion, in accordance with those authorities, that the court ought not to supersede the commission, but to make an order to suspend all proceedings under it until further order, and that Mr. Blackmore be at liberty to apply for further relief upon his petition to the lord chancellor or the lords justices in Trinity Term next, and that he should have the management of his business and estate without the control or interference of the committee of his person, with liberty to apply in the meantime."

In the Act of 1890, Sects. 101 to 106 lay down the means and powers of traversing or superseding an inquisition.

4. ESCAPE AND DISCHARGE OF CERTIFICATED PATIENTS.

In concluding the remarks upon the care which the law takes regarding the care and safety of a lunatic, it is well to observe :—

1. If he escapes from confinement he must be retaken within fourteen days, the time for which the proceedings previously resulting in detention hold good; if he remains at large for over fourteen days the whole process must be repeated to enable him to be again legally detained.

2. The petitioner, or the nearest of kin, or even a representative of the petitioner or of the patient, can obtain the release of a lunatic on request, provided that the medical officer under whose keeping he is does not oppose the release, the power to veto release under these circumstances being placed in his hands.

3. A single commissioner in lunacy has the same power to release a lunatic, subject to the same veto; but

4. Two commissioners acting in concert have absolute power to order a release without any provision for the consent of the medical officer.

Apparently only the Secretary of State has power to release a criminal lunatic.

On this subject of discharge of lunatics, Dr. Taylor's original remarks may well stand, although they refer to old cases.

In forming an opinion as to the propriety of discharging a person who has once been confined as a lunatic in an asylum, the particulars of his case should be examined with the same caution as if the object were to confine him for the first time. The question of liberation is commonly restricted, like that of restraint, to cases of mania and monomania. It may so happen that an individual has a lucid interval at the time of examination, in which case it will be necessary to make more than one visit. One who has been guilty of a heinous crime like murder, should never on any pretence be discharged. There are often long lucid intervals in homicidal mania, and it is impossible to be

certain that the disease is entirely removed. The case of a clergyman named Watson, who several years ago shot at the Master of the Rolls, is a case in point. He made repeated applications to be liberated from the Broadmoor Criminal Lunatic Asylum on the alleged ground that he was quite sane; but the Home Secretary refused to accede to this. At length (1882) he made a murderous attack upon the medical superintendent of the asylum; and it is to be hoped that this obviously dangerous lunatic's liberation will never take place. If the person has manifested the least disposition to suicide, we should be extremely cautious in liberating him, for suicidal mania is often artfully concealed under a cheerful exterior. We cannot always test the propriety of granting liberation by the lightness of the offence for which a criminal lunatic has been confined. The circumstances under which the most trifling offence has been committed may show that the mind is wholly unsettled with regard to moral responsibility; and such lunatics can never be trusted, even when there is a great improvement in their language and deportment. The unhappy result of prematurely discharging a criminal lunatic was seen in the case of a man named Thom, otherwise styling himself as Sir William Courtenay. He was shot while rioting with many others near Canterbury, in June, 1838. The whole life of this man seems to have been made up of a mixture of eccentricity and insanity. He was guilty of the most flagrant perjury —was tried, found insane, and confined as a lunatic. After the lapse of about six months it was thought that he was so much improved as to allow of his discharge, although even at this time it appears that he fancied himself to be the Saviour. On his discharge he was guilty of many extravagant acts. He collected a number of ignorant persons as his followers, and infected them with his delusion. He resisted the soldiers who were sent to apprehend him, and eleven lives were lost on the occasion. Winslow relates that a man was confined in an asylum while suffering from a delusion respecting the fidelity of his wife. For many months this idea was uppermost in his mind, and appeared to absorb all his thoughts. At the expiration of eight or nine months he appeared to be much improved in bodily and mental health, and the delusion had apparently less hold of his imagination. Eventually he cunningly declared that his mind was quite at ease respecting his wife, and that he no longer believed that she had or could have been unfaithful to him. Under a mistaken impression that he had quite recovered, the patient was discharged from the asylum and permitted to return home. For several days after joining his family he appeared quite well, so clearly and effectually did he mask his lunacy from those immediately about him. A week or ten days after his return he murdered his wife and child, believing that the former had committed adultery, and that the child was not his own ("Obscure Dis. of the Brain," p. 215). A medical man cannot always be responsible for unfortunate consequences of this kind; but these and other similar instances show that great risk is incurred in hastily allowing the discharge of a lunatic who has once been guilty of a crime, however slight, so palpably depending on a disordered mind. On other occasions lunatics have been prematurely liberated, and the most disastrous consequences have resulted. A man discharged from an asylum lived for some days quietly at home with his wife and child, when he

suddenly attacked and killed them, his insane delusions not having been completely removed. Brierre de Boismont furnishes several examples of the dangers of this proceeding, in which men destroyed themselves after premature liberation ("Ann. d'Hyg.," 1869, 2, p. 436).

5. RESPONSIBILITIES OF THE INSANE.

These may be divided into civil and criminal responsibilities, and starting as the law does with the assumption that every man is sane until he is proved insane there is no subject, throughout legal medicine, that has given rise to greater controversy than the fixing of the degree and form of insanity which shall free a person from a contract into which he has entered, or from the consequences of an action he has committed.

To judge by verdicts the point is, now in the twentieth century, as far from decision or even further than it has ever been; so far as the law is concerned in criminal cases a *dictum* exists (*vide infra*, pp. 871 *et seq.*), but the difficulty is in fixing the facts in accordance with this *dictum*. The subject will be discussed in the following order:—

Marriage.
Ordinary civil contracts.
Testamentary capacity.
Criminal responsibility.

Insanity as an Impediment to Marriage.

Insanity is deemed in law to be a civil impediment to marriage, because it is considered that there cannot be that rational consent which is necessary to the validity of a contract. The marriage of a lunatic is therefore called a nullity, and is void *ab initio*. All that the law requires is that there should be good proof of insanity at or about the time of the contract. If this be offered, and it be alleged that the contract was entered into during a lucid interval, then the person who would benefit by the allegation must prove its existence. The suitableness of the marriage, as well as the conduct of the party during or after its performance, will also be considered by the court. In *Turner* v. *Myers*, a lunatic who had recovered from his lunacy instituted a suit to set aside a marriage which he had voluntarily contracted while in this state. The marriage was declared void (*Med. Gaz.*, vol. 8, p. 481). The case of *Baldry* v. *Ellis* (Norwich Sum. Ass., 1851) will be found of interest in relation to the matrimonial engagements of alleged lunatics. A still more recent decision (1882) confirms the above view.

In *Reed* v. *Legard* (Court of Exch., May, 1851), a question arose whether a lunatic was responsible for necessaries supplied to his wife. The articles supplied were for the sole use of the wife, the husband being a confirmed lunatic and the inmate of an asylum. The court held that the fact of a husband being from the visitation of God unable to manage his affairs did not absolve him from the obligation, which he contracted when he married, to provide necessaries for the support of his wife. He was then of sane mind, and although he had subsequently become insane, that obligation was not revocable under the circumstances. (See also a report of the case of *Seaton* v. *Adcock*, *Jour. Psych. Med.*, 1851, p. 297.)

Whatever may be the law about the marriage of a man who is at the time of his marriage a lunatic, there can be no doubt that thousands of marriages are consummated, which from the mental condition of the contracting parties are most impolitic, to use no stronger word (*vide* Dr. R. P. Smith, on "The Prevention of Insanity," *Lancet*, 2, 1900, pp. 388 *et seq.*, who there states that many cases of the marriage of congenital imbeciles are on record).

Responsibility in Ordinary Civil Contracts.

The validity of *civil contracts* entered into by lunatics will depend mainly on the circumstances which accompany the act. If there be nothing unreasonable in the conduct of the lunatic, and the party with whom he contracts has no knowledge or suspicion of his insanity, then the contract will be binding on the lunatic and his representatives. It was so held in *Monckton* v. *Cameroux* (Exch., June, 1848). This was an action by the administrator of a deceased person to recover from the defendant, as secretary of an insurance office, the sum paid by him as the consideration for two annuities, the foundation of the action being, that at the time of the arrangement in question the deceased was not in a sound state of mind. At the trial it appeared that the negotiation had been conducted by the deceased with apparent prudence, sanity, and judgment, and that the arrangement entered into by him with the office was just such as any prudent person would have been expected to make with a view to his own interest. The deceased, who died very soon after the business had been arranged, was, both before and after the transaction, in an unsound state of mind. Under these circumstances, this action was brought by his representatives, and a verdict recovered by them, subject to the opinion of the court on their right to recover as on the entire failure of consideration. The Chief Baron, in giving judgment in favour of the defendant, said it was sufficient for the purpose of this case to lay it down as a general rule, that when a person of apparently sound intellect enters into a contract, such as any ordinary person would enter into with others who act *bonâ fide*, and the parties cannot be restored to their former condition, it is no ground for setting aside the contract that one of them was at the time *non compos mentis*. On appeal to the Exch. Chamber in May, 1849, this judgment was affirmed. (See also the case of *Staniland* v. *Willett*, Vice-Chanc. Court, November, 1848.) In the case of *Donat* v. *Haniquet* (Guildhall Sittings, 1854), on an action to recover a sum of money, in which the defence was that the defendant was of unsound mind at the time of the contract, Crompton, J., held that unless it was shown that the plaintiff had taken advantage of the defendant's unsoundness of mind, he would be entitled to recover the amount claimed.

O'Reilly v. *Bonney* (Chanc. Div., June 8th, 1904, before Mr. Justice Swinfen-Eady) was a case of interest in this respect. No medical evidence seems to have been called.

Miss Barbara Louisa St. John O'Reilly, the lady described as "not of unsound mind, but requiring supervision," succeeded in her action to have set aside a deed purporting to hand over the whole of her property to Miss Marie Bonney, an elderly lady in whose care she had been since 1876, most of the time at Warwick Gardens, W. Miss Bonney's brother, Mr. Frederic Bonney, solicitor, of 89, Chancery Lane, was made co-defendant. The property in question was 800*l.* a year and a house in Nevern Road, Earl's Court.

Miss O'Reilly was entitled to 7,804*l.* in a marriage settlement fund, and 845*l.* Consols on her father's death, which took place in 1878. In 1876 she had been placed by her relatives with the defendants, and remained with them until September, 1901. On September 18th, 1881, the following letter was written, under which the defendants laid claim to the whole of her property:—

"Darling Old Mother,—As I have always had great affection for you, and as you have taken care of me for so many years, and in consideration of the many kindnesses I have received from you, I hereby transfer to you, your heirs, administrators, or assigns, all my money in Consols and invested on mortgage, and transfer you all my interest in 15, Nevern Road, Earl's Court, and the furniture at Nevern Road, and I hereby undertake, whenever called upon by you to do so, to sign or execute any deeds or documents that may be necessary to transfer to you all my property."

Plaintiff alleged that she wrote the letter under undue influence from the defendants, and without having had independent legal advice, and she sought to have it set aside, to have certain deeds and furniture returned, and to have an account taken of what was due to her. The defendants, who denied undue influence, and set up that the plaintiff wrote the deed of gift voluntarily, counterclaimed for 500*l.* for a breach of agreement on Miss O'Reilly's part to continue to live with them.

His lordship gave judgment. With regard to the letter of September 18th he did not believe that Mr. Bonney took no part in its preparation. He was perfectly satisfied that it was not the plaintiff's unaided composition; he did not believe she could have composed such a document. It was evidently a lawyer's letter, and purported to be in consideration of the kindness the plaintiff had received. There was no suggestion in it from the beginning to the end of the legal and valuable consideration set up in the pleadings that Miss Bonney was to take a larger house and maintain the plaintiff for the rest of her life. Notwithstanding Mr. Bonney's denial, the only conclusion possible was that he had drafted the letter. He was in the room at the time, and it was not suggested that Miss O'Reilly had any other legal advice on that occasion. As to the assignment of the Nevern Road house from the plaintiff to Miss Bonney, he regretted that any solicitor should have so far forgotten himself and his professional position as to have prepared such a document. Mr. Bonney knew the circumstances under which the plaintiff had been placed with his sister, and he was an inmate of the same house. It was quite impossible for such a document to stand. Mr. Bonney denied that he had had any of the 800*l.* mortgage obtained in 1898, but a cheque for 100*l.* was clearly brought home to him. Mr. Woodbridge had nothing to do with the preparation of the deed of September 18th, and appeared to have acted throughout in a straightforward manner. It was only fair to the defendants to say that in the early part of the time Miss O'Reilly seemed to become attached to Miss Bonney, and that no physical restraint was ever imposed upon her, but he was satisfied that she had no mind or intention to hand over her property, and the deed must accordingly be set aside, plaintiff must have delivery to her of all documents in question, and an account of the moneys received by the defendants respectively, the defendants being entitled to the cost of her maintenance.

The plaintiff's claim was, therefore, allowed, and the counterclaim dismissed, defendants to pay the costs.

Testamentary Capacity.

This must be discussed under the following heads:—

A. A disposing mind.
B. Aphasia and will making.
C. Delusions and will making.
D. Eccentricity and will making.
E. Undue influence and will making.
F. Suicide and will making.
G. Wills *in extremis*.

A. **A Disposing Mind.**—Questions involving the testamentary capacity of persons are of frequent occurrence, and medical evidence is commonly required for their solution. When property is bequeathed

by the testator out of the usual order of succession, it may be alleged by the relatives that he was wholly incompetent to understand the nature of the deed—either from actual insanity, the imbecility of age, or that natural failing of the mind which is so often observed to occur from disease or on the approach of death. A *disposing mind* is what the law requires to render a will valid, so far as mere mental condition is concerned. The best test of the capacity for this act is that a man at the time of signing the will should know the nature and amount of his property and the just claims of those who are nearly related to him. It has been truly said that the evidence of the medical attendant on this point at the time of the execution of the will, is worth more than the opinions of experts or of witnesses who may have seen the testator at other times and under other circumstances (*Med. Times and Gaz.*, 1871, 2, p. 203). Another writer has remarked that the capacity for making a will does not rest upon the question of sanity or insanity, but rather upon the proof of competency or incompetency in the testator.

A medical man is frequently of necessity a witness to a will. He should remember that when he signs his name to it as a witness, he is practically testifying to the competency of the testator to make the will.

Bodily disease or incapacity does not affect the validity of a will, unless the mind be directly or indirectly disturbed by it.

In all cases of this kind, the law looks exclusively to the actual *effect* of the bodily disease upon the *mind;* and this is commonly a question to be determined by the jury from the testimony of those who have attended the deceased, as well as from the evidence of medical experts, but so far as a "disposing mind" is concerned judges look very much more to the actual distribution of the property than to anything else, and so long as the terms of the will do not seem to inflict any substantial injustice upon any near relatives, it is probable that so far as testamentary capacity is concerned the will will be upheld (*vide Duke of Manchester* v. *Bennett*, Kingston Lent Ass., 1854, in former editions; the will was upheld, and on appeal the matter was compromised).

Test of Capacity.—A person must be considered to be of a sane and disposing mind who knows the nature of the act which he is performing, and is fully aware of its consequences. From some decisions that have been made, it would appear that a state of mind for which a party might be placed under interdiction or deprived of the management of his affairs would not render him incompetent to the making of a will. The validity of the will of a lunatic was once allowed, although made while he was actually confined in an asylum; because the act was rational, and it was such as the lunatic announced his intention of making some years prior to the attack of insanity. In *Nichols and Freeman* v. *Binns* (Prob. Court, August, 1858) the question was whether the will of a Mr. Parkinson, made in a lunatic asylum, was executed during a lucid interval. The jury found a verdict in favour of the will. The insanity of a person when not already found insane under a commission, must not in these cases rest upon presumption, but be established by positive proof. In *Sharpe* v. *Macauley* (Winchester Aut. Ass., 1856), Martin, B., advised the jury, in coming to a conclusion on the question at issue, whether the testator had a "sound and disposing mind," to look not to the opinions of others, but to the man's own acts as well as to his correspondence. A disposing mind

implied that a man understood the nature of his property, the use and benefits arising from it, and had sense and discretion to select persons to enjoy it after his death. A man may have laboured under delusions and have been confined as a lunatic, yet at the date of his will he may have had a disposing power. The main question therefore is—Was the testator of disposing mind when the will was executed? This may be deduced from direct evidence of his condition as well as from the provisions of the will itself. Cresswell, J., held (in *Davey* v. *Comber*, December, 1862) that when it was shown that a man had been mad at some period of his life, it was incumbent on those who set up his will to prove that his madness had passed away before it was executed. In holographic wills the handwriting will sometimes furnish strong evidence. Delusion may be apparent in the mode in which the property is described or distributed. (See "Ann. d'Hyg.," 1864, 1, p. 404.)

There is, however, a difference between unsoundness of mind represented by incompetency to manage affairs, and that defect of mind which deprives a man in a legal sense of the power of disposing of his property by will. A mind may be clear enough for the performance of some of its functions, and yet not clear enough for the performance of others. A man may give clear and reasonable directions for the preparations of a will, and even sign it in a natural manner, but he may be governed by caprice and passion amounting to insanity in the disposition of his property. It has been well remarked that "so long as human nature is the mysterious phenomenon that it is, and the empires of reason and unreason border so closely on each other, we must expect often to err when we try to discover whether a man, alternately the subject of both, was in or out of his mind at any given moment." A disposing power may exist in the mind of a person not legally competent to manage his affairs. The criteria applied are different, and the existence of such a power must be a matter to be proved by evidence in each particular case.

To simply ask a medical expert on these occasions whether a testator was competent to make a will is to put a very ambiguous question. A will may be simple or complex, and while there may be capacity for one, there might not be for the other. Ordonnoux ("Jurispr. of Med.") remarks:—"In contesting the probate of any will on the ground of incapacity, the issue is not whether the testator could have made a will in general or any kind of will, but whether he had capacity enough to make the particular will in dispute: and in order to form a proper judgment on this point, a medical expert should hear the instrument read before he gives an opinion." (See *Amer. Jour. Med. Soc.*, January, 1870, p. 217.)

Mr. Stanley B. Atkinson, barrister-at-law, has kindly offered the editor the following notes on testamentary capacity in general:—

"When a will is propounded for probate, the usual claims (apart from mere informality) for its reduction are either (1) that the testator was subject to some undue influence at the time the will was executed" (*vide* "Undue Influence"); "or (2) that the testator at that time had not the necessary *animus testandi*, *i.e.*, a sane memory, judgment and will in the dispositions effected.

"The mental sanity of the testator is always presumed, and the issue is narrowed down to the question, '*Was this man capable of making this particular will at the time of its execution?*' In each case the jury is largely influenced by the internal evidence afforded by the contents of

the will; they will not recognise a minor mental deficiency in its originator, if they think it is 'a just and proper will.' Thus, if the solicitor has previously received full instructions, which he has correctly drafted, it is not necessary that the testator should appreciate the whole of the contents when he finally executes the instrument (*Perera* v. *Perera*, 1901, A. C. 354). Eccentricity in habits of life is not sufficient evidence to upset a will (*Pilkington* v. *Cray*, 1899, A. C. 40, P. C.). But where delusions of direct commands from the Deity as to the use of his property are proved, a testator may be held to have an insufficient *animus testandi* (*Hope* v. *Campbell*, 1899, A. C. 1, H. L.)."

"The medical attendant may be of great service in witnessing that the testator at the time of executing the will was able to clearly enumerate as well his dependants as all his possessions, and also that he appreciated their respective merits. This power will require a much stronger mental equilibrium than is demanded for a correct contractual capacity, Subsequent insanity (*e.g.*, the common verdict of a coroner's jury in cases of *felo de se*) will not invalidate a will. Precedent or contemporary mental facility *primâ facie* suggest incapacity."

"Degrees of mental impairment have been considered by courts. In 1885, *Re Dewhurst's Trusts* (55 L. T. R. 427), the acts were allowed of a man who was '*paralytic and unable through infirmity of mind to manage his own affairs.*' In 1888, *Re Barber* (58 L. T. R. 756), where a trustee was '*helpless in bed, and owing to his loss of speech and inability to write, it was hard to say what he understood,*' the Probate Court refused to consider his condition as other than physical infirmity."

B. **Aphasia and Will Making.**—In connection with wills and the medico-legal questions arising therewith, it may not be out of place to insert here a rough diagram (fig. 35) of the parts of the brain and sense organs concerned in the process, with a very brief sketch of the physiology of the matter. For fuller details, with experiments, etc., the reader is referred to works on cerebral localisation.

We may divide wills into :—

(*a*) Those written by the testator in his own handwriting, and at his own discretion.

(*b*) Those, more or less, formally written by others and submitted to the testator to read and sign, or which are read over to him before signature.

(*c*) Wills made in other ways (*vide infra*, p. 861).

As regards the first class—holo-auto-script we may term them—the only points to be considered are :—

1. Is the actual manuscript written in such a manner as to be legible and capable of translation into definite propositions.

2. Does it by these propositions clearly express statements which can be accepted as the then wishes of the testator.

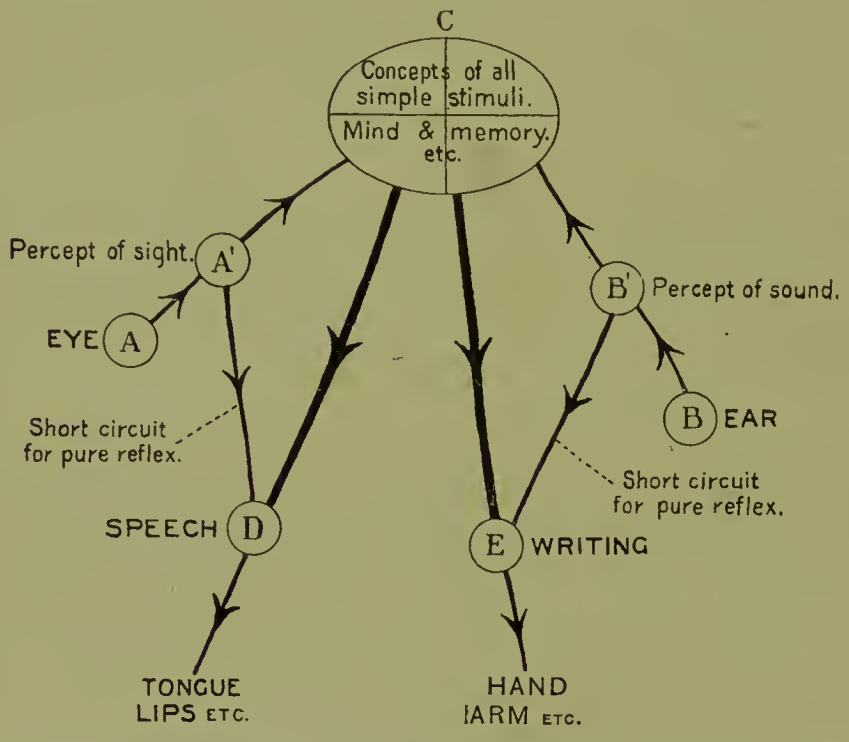
3. Was the testator labouring under any delusion regarding any of the possible expectant legatees which prevented him from acting justly by such. Questions of agraphia and aphasia in its varieties can hardly arise, for the mere existence of the document in legible script will *ipso facto* prove the absence of the former, and the latter is immaterial in writing, except in so far as the general terms of the will may seem to show the more complicated effects of the presence of sensory aphasia and lack or disturbance of memory (delusions, etc.).

It is in the second class that we meet with trouble from the various states, which we may here summarise as "aphasia" in its widest and broadest sense.

In the *B. M. J.* for 1897, vol. 1, p. 1205, 1272, etc., will be found a very complete analysis of the question, "Can an aphasic make a valid will?" by Dr. Byrom Bramwell; and, again, at the annual meeting of the British Medical Association in 1898 (*vide B. M. J.*, vol. 2, 1898), the matter received very full discussion. In the *B. M. J.*, vol. 2, 1898, p. 825, is a leader on the subject, from which the following statement of Lord Robertson is taken :—"The jury had not to decide whether the testatrix in question was sane or insane; but merely whether she had mind enough to understand, and did in fact understand, the will she purported to have made. The mere fact that she was alleged to have been eccentric did not render her incapable of making a will, if she had sense to understand it. The jury must say whether the will really was her will. They must not decide against it unless they were satisfied either that she was unfit to make it—that is, that she had not sufficient mind to make it—or that she was weak, and was led into making it by other people."

Aphasia has for sub-divisions aphemia, agraphia, word-blindness, word-deafness, etc., the explanation of which may be seen by a glance at the diagram :—

Fig. 35.



EXPLANATION OF LETTERS.

A' and B' are parts of the cerebral cortex, probably in occipital lobe; C is certainly situated in the temporo-sphenoidal lobe, so far as sight and hearing are concerned; D in Broca's convolution; E in the ascending frontal convolution.

Lesion of A and A' or between A and A' = blindness
Lesion of B and B' or between B and B' = deafness
} in their ordinary meanings.

Lesion of C or between A' (and B') and C = word-blindness (or word-deafness), *i.e.*, word is heard or object seen but not appreciated; no concept of it.

Lesions between C and D or E constitute motor aphasia or agraphia.

which may be thus explained :—

1. External stimuli of every possible nature and variety must fall upon terminal sensory organs, skin, ear (B in fig.), eye (A in fig.), etc.;

before they can be appreciated; in such terminal organ they excite a process in the nervous apparatus there provided, which process is

2. Carried to the cortex of the brain, and there excites in turn an impression that something has been seen or heard (percept); but such impression is

3. Appreciated by the mind, becomes a concept, *i.e.*, the meaning of the external object or word is recognised, in some (evolutionary), higher centre of the brain.

4. This higher centre sends messages down to the motor (speech or writing) centres, which messages are translated into speech or writing by the terminal organs executing the movements of speech or writing.

5. Obviously there are myriads of other percepts and concepts with which we are only concerned in our present considerations in so far as by disarrangement they cause delusions and hallucinations, etc., constituting "lunacy" in general.

6. These false concepts may quite possibly be confined strictly to other subjects than those concerned in the will, and it is our business to estimate in any given case whether the concepts in connection with the will are true or false, and whether the outward expression in speech or writing corresponds with true concepts. What in other words the Court wants is unbiassed and convincing evidence that the will represents intentions which are obviously only the expression of true concepts: this is the physiological meaning of a disposing mind.

7. Inasmuch as concepts of objects form "a disposing mind," lesions of (C) itself are the most important obstacles to will making, for if only A *or* B be cut off from C, we can still reach C by the alternative route. Neither deafness nor blindness is a bar to the execution of a will, nor, indeed, the combination of the two, provided the testator voluntarily writes a will, and there are honest witnesses to prove that the written or spoken (dictated) will correctly represents the wishes of the testator.

8. Lesions between C and D *or* E may in like manner be overcome by alternate routes, but if the testator can neither speak nor write (*vide* case in *Lancet*, 1896, 2, p. 1702), other means must be found for estimating whether a will correctly represents the testator's intentions, of which a very ingenious example was given in the medical journals a few years ago, which constitutes the third form of making a will.

The case *Moore* v. *Moore*, 1900, was that of a person who was, from disease affecting the brain, unable to write, and could with difficulty be made to understand what was said, but evidently wished to make a will, and could also read and understand what was written. The medical man in attendance [I am unable to find the exact reference, Ed.], caused the names of possible legatees to be written, each on a separate card, and the articles of property also each on a separate card, the patient was then able to put a name and a piece of property together by means of these cards. Probate in the sense of these terms was granted (*Times*, February 13th, 1900).

C. **Delusions and Will Making.**—The validity of wills executed by persons affected with monomania is often a subject of dispute. The practice of the law indicates that the mere existence of a delusion in the

mind of a person does not necessarily vitiate a will, unless the delusion form the groundwork of such will, or unless the most decisive evidence be given that, at the time of executing it, the testator's mind was influenced by it. Strong evidence is often derivable from the will itself, especially when a testator has drawn it up of his own accord. In the case of Barton (July, 1840), the Ecclesiastical Court was chiefly guided in its decision by the nature of the instrument. The testator, it appeared, laboured under the delusion that he could dispose of his own property to himself, and make himself his own legatee and executor. This he had accordingly done. The instrument was pronounced to be invalid. But a will may be manifestly unjust to the surviving relatives of a testator, and it may display some of the extraordinary opinions of the individual; yet it will not necessarily be void, unless the testamentary dispositions clearly indicate that they have been formed under the influence of a *delusion*. Some injustice may possibly be done by the rigorous adoption of this principle, since delusion may certainly enter into a man's act, whether civil or criminal, and it may not be always in our power to discover it; but, after all, this is perhaps the most equitable mode of construing the last wishes of the dead.

The elaborate summing-up of Gorell Barnes, J., in the case of *Roe* v. *Nix and others*, contains many of the chief points to be considered in estimating the testamentary capacity of a lunatic suffering from delusions (*The Times Law Rep.*, December 10th, 1892).

The great point at issue in the case, that of the Duchess of Manchester, was purely of a medical nature: namely, whether the delusions or wanderings under which the Duchess laboured during her illness were the rooted delusions of *insanity* —fixed mental derangement, or only the temporary delusions of *delirium*, the result of the disease under which she was labouring. In granting a new trial, the Vice-Chancellor very properly stated that, in reference to permanent proper insanity, there was great difficulty in proving a lucid interval. A patient so affected is not unfrequently rational to all outward appearance, without any real abatement of the malady; so that, in truth and substance, he is just as insane in his apparently rational as in his visible raving fits. But the apparently rational intervals of persons merely delirious are for the most part really such. Delirium is a fluctuating state of mind created by temporary excitement, in the absence of which, to be ascertained by appearance and conduct, the patient is most commonly really sane. Further, in cases of permanent or fixed *insanity*, the burden of proof lies on the person setting up the instrument; the presence or absence of delusions ought to be tested at the time; and it should be shown by indisputable evidence that on the subject in question delusion is absent from the mind. If the delusions arose from *delirium*, the onus of proof would not be on the party setting up the instrument, but on those who oppose it.

There probably never was a case in which the necessity of drawing a clear distinction between *mania* in its acute form and *delirium* dependent on disease, was more strongly manifested than in this. The medical facts for the basis of an opinion were really few and simple, and they appear to lead to the conclusion that the occasional wanderings or delusions of the Duchess were the results of delirium from bodily disease, and not of permanent insanity—that this state is quite compatible with the existence of intervals of perfect competency—and that the conduct of the Duchess, at the time of executing her will, was such as to show that she had a full knowledge of the nature of the act which she was performing.

At the same time it would be to the last degree injudicious for a

medical man to allow a patient to make a will in a brief interval between attacks of delirium.

We may draw this distinction between delirium and some delusions that the former is due to a disturbance of the whole cerebral cortex, the latter to disturbance of only a part of the cortex, and that a part which may or may not be concerned in will making (*vide* explanation of fig. 35).

D. **Eccentricity and Will Making.**—The evidence in these cases sometimes amounts to proof of eccentricity only on the part of the testator, or in the deed itself; but a clear distinction must be here drawn. The will of an eccentric man is such as might always have been expected from him; the will of one labouring under insanity (delusion) is different from that which he would have made in an unaffected state —the instrument is wholly different from what it would once have been. It has been justly observed that the insane are eccentric in their ideas, their language, or their conduct; but the merely eccentric have but a voluntary resemblance to the insane (Jamieson's Lect., *Med. Gaz.*, vol. 46, p. 180). They can, if they please, alter their conduct and act like other persons neither eccentric nor insane. In a case in the Probate Court, Sir J. Hannen observed that it was impossible to define exactly the distinction between eccentricity and insanity, or to draw the exact line between sanity and insanity, but for practical purposes we are able to say in a particular instance whether a man is sane or insane or only eccentric.

In the case of Stott, a medical electrician, whose will was disputed by his daughter on the ground of insanity, it was proved that the testator fancied he could deliver pregnant women by means of electricity; and he actually proposed to the wife of a baker living in the neighbourhood, to bring about her accouchement by a number of wires connected with an electrical machine. The will was pronounced invalid, not so much on account of this absurdity, as of the violent and unnatural treatment to which he had subjected his daughter. It appeared that he had taken, as we now and then find in monomaniacs, a most unaccountable and causeless dislike to this girl from her earliest infancy.

The court found that the will was valid, and that there was no proof of delusion or of insanity, either moral or intellectual. The deceased was a most unamiable being; but still his acts were not irrational, nor inconsistent with soundness of mind (Prerog. Court, August, 1846). In no case probably has eccentricity come so near to insanity as in this.

Wills are sometimes contested more on the ground of eccentricity than of insane delusion; but if eccentricity only be proved, a Court will not interfere.

In the case of *Morgan* v. *Boys* (1838), it was proved that the testator, by his will, had left a large fortune to his housekeeper. The will was disputed on the ground that it bore intrinsic evidence of the deceased not having been in a sane state of mind at the time of making it. After having bequeathed his property to a stranger, the testator directed that his executors should "cause some parts of his bowels to be converted into fiddle-strings, and others should be sublimed into smelling-salts, and that the remainder of his body should be vitrified into lenses for optical purposes." He further added, in a letter attached to his will, "The world may think this to be done in a spirit of singularity or whim; but I have a moral aversion to funeral pomp, and I wish my body to be converted into purposes useful to mankind."

The judge held that insanity was not proved: the facts merely amounted to *eccentricity*, and on this ground he pronounced for the validity of the will. It was proved that the deceased had conducted his affairs with great shrewdness and ability; that he not only did not labour under imbecility, but that he had been always treated during life as a person of indisputable capacity by those with whom he had to deal. The best rule to guide the court, the judge remarked, was the conduct of persons towards the deceased, and the acts of his relatives evinced no distrust of his sanity or capacity while he was living. The deceased had always been noted for his eccentric habits, and he had actually consulted a physician upon the possibility of his body being devoted to chemical experiments after death, In the case of *Mudway* v. *Croft* (Prerog. Court, August, 1843), a will contested on the ground of insanity, but defended on the plea of eccentricity, the judge said:—"It is the prolonged departure, without an adequate external cause, from the state of feeling and modes of thinking usual to the individual when in health, that is the true feature of disorder of the mind." See also the case of *Waring* v. *Waring* (Prerog. Court, February, 1847).

The case of *Yglesias* v. *Dyke* (Prerog. Court, May, 1852) presents some singular points of interest in reference to the distinction between eccentricity and insanity.

The testatrix bequeathed by her will a considerable amount of property, which, as she was illegitimate, and as it was alleged incompetent to make a will, was claimed by the Crown. It was proved that she was of dirty habits, and among other facts that she kept fourteen dogs of both sexes, which were provided with kennels in her drawing-room. Two of the dogs slept in the same room, and one, which was blind, slept in the same bed with her. The testator also had a propensity for guinea-pigs, and was subject to singular delusions.

Some evidence was adduced to show that, in spite of these strange freaks, she was able to manage her own affairs; but the court pronounced against the validity of the will, on the ground that the testatrix had for a long period laboured under insane delusions, and there was no proof that these had ceased. Her eccentricity was the result of insanity. Nothing, however, is more common than to find this propensity for animals existing among sane childless women who live solitary or secluded lives. One old lady generally kept her sitting-room full of monkeys, to the great annoyance of her visitors. She was a woman of good family, and of a shrewd and strong mind, well able to look after her affairs and to dispose of her property. She was considered to be eccentric, but there was no trace of insanity about her. Other women are not happy unless surrounded by parrots, or unless their sitting-rooms are converted into aviaries for all kinds of birds. In the case of Mrs. Cumming, it was alleged that the lady whose sanity was disputed had a strong propensity for cats, these animals being provided with meals at regular hours, and furnished with plates and napkins. In this case a verdict of insanity was returned, not so much on account of the special attention shown to the cats, as from her acts in reference to her property and from her association with certain persons who appear to have taken advantage of her intellectual weakness. The fact is, the propensity for animals proves nothing in relation to the existence of insanity, unless there is at the same time good evidence of intellectual

aberration. (See the case of *Dryden* v. *Fryer*, Q. B., December, 1850, *Jour. of Psych. Med.*, 1851, p. 285.)

Two cases came before the Probate Court, in which it was necessary to draw the line between eccentricity and insanity in reference to wills. Although the facts proved in reference to insanity in the two cases were somewhat similar, the decision was in favour of the will in one case and adverse to it in the other. In both there was a departure from the rule which had hitherto influenced justly the verdicts of juries, *i.e.* in the ignoring of the fact that the testator in each case had managed his affairs during life without any imputation on his sanity or competency, or any interference in his affairs on the part of relatives.

In *Davis* v. *Gregory* (Prob. Court, January, 1873), the question was whether one Thomas Holme, when he made his will in April, 1870, was of sound mind. It was proved that during a long life he had conducted his affairs with prudence, had always been treated as sane by his relatives and those who knew him; and, although his capacity was of a low character, there was nothing to indicate actual insanity in his correspondence. In addition to the alleged existence of delusions, there was another indication of unsoundness of mind—namely, perversion of the natural affections, and a complete change of character and habits.

In spite of these facts, which point strongly towards unsoundness of mind and a want of capacity, the court pronounced judgment in favour of the will.

In the second case, *Boughton* v. *Knight* (Prob. Court, 1873), the will was contested by the sons of the testator on the ground of mental incapacity. It was admitted that the testator was a reserved man and shunned society. He had for some years lived alone, and was peculiar and eccentric in his habits. He was fond of listening to German bands and seeing his servants dance, and he fed rats and shot rooks in company with a female servant. He was of a capricious and suspicious disposition, and had a delusion that he had perpetrated crimes, and that people were watching him. On the other hand, he had managed his own affairs without any imputation on his sanity, and his correspondence showed that he was rational and had complete capacity for conducting business.

Sir J. Hannen said that "whatever degree of mental soundness might be required for other acts—for responsibility for crime, for capacity to marry, for capacity to contract, for capacity to give evidence—he had no hesitation in telling them that the highest degree of all was required in order to constitute capacity to make a testamentary disposition." He quoted from a judgment of Cockburn, L.C.J., in another case the following extract, which appears to embrace in a small compass the legal conditions required to render the will of an eccentric man valid. "It is essential to the exercise of such a power (to make a will) that a testator shall understand the nature of the act and its effects; shall understand the extent of the property of which he is disposing; shall be able to comprehend and appreciate the claims to which he ought to give effect; and, with a view to the latter object, that no disorder of the mind shall poison his affections, pervert his sense of right, or prevent the exercise of his natural faculties; that no insane delusion shall influence his will in disposing of his property and bring about a disposal of it which, if the mind had been sound, would not have been made." (See the case of Goodfellow,

Med. Times and Gaz., 1870, 2, p. 343; 1871, p. 203.) The jury found that the deceased was not of sound mind when the will was executed.

On these occasions the will is more or less unjust to relatives or those who have a direct claim on the testator. It is easy in such suits to magnify acts of eccentricity into proofs of insanity; and to arrive at the inference that the provisions of the will were influenced by an insane delusion, and did not express the real mind of the testator. Thus a condition of mind which will lead to no interference with the acts of a man during life, may form a subject of costly litigation after his death. It was an admitted fact that the testator in this case had capacity to manage his property, but it was held that he had not sufficient capacity to dispose of that property by will. It must be remembered in reference to these cases that persons who have been eccentric through their lives, and have set at defiance all the customary rules which govern the conduct of men in a normal state, are not likely to make any other than eccentric wills, which may, however, be the real expression of their minds.

It is difficult to suggest in what manner medical evidence can be brought to bear on cases of eccentricity involving the question of testamentary capacity. A medical expert may give an opinion whether the acts of the eccentric testator furnish proof of the existence of delusion. He may also be able to say, in looking to the previous habits and mode of life of the testator, whether at or before the making of the will there has been any change of habits or character which would indicate insanity—the existence of a causeless hatred to members of the family not mentioned in the will, and a suspicion and distrust of all around him. In reference to cruelty to children, unnatural conduct to a wife, the keeping and feeding of animals, these are points which can be as well considered in relation to testamentary capacity by a jury of educated men, as by experts in insanity.

E. **Undue Influence in Will Making.**—"Undue influence" is an extremely common plea raised to upset a will. The phrase is a very elastic one, and it is left to the conscience of persons as disinterested as it is possible to find to construe it in individual cases, and, moreover, the evidence they give is weighed by an absolutely impartial judge.

It must be assumed that "undue influence" generally arises when the testator is under the average in mental strength, hence it is very liable to be raised when the testator is suffering from incipient dementia, such as old age commonly brings in its train; yet these are the very cases where someone must take more than especial care in looking after the testator (daughter, wife, niece, or stranger), for he cannot take care of himself; it is under such circumstances that, when the devoted nurse benefits under the will, ill-natured and disappointed relatives raise the question of undue influence often on very flimsy grounds. In these cases if a medical man is present when a will is executed, he may easily satisfy himself of the state of mind of a testator, by requiring him to repeat from memory the mode in which he has disposed of the bulk of his property. A medical man has sometimes placed himself in

a serious position by becoming a witness to a will without first assuring himself of the actual mental condition of the testator (case of the Duchess of Manchester). It would always be a good ground of justification if, at the request of the witness, the testator had been made to repeat substantially the leading provisions of his will from memory. If a dying or sick person cannot do this without prompting or suggestion, there is *primâ facie* reason to believe that he has not a sane and disposing mind. It has been observed on some occasions, when the mind has been weakened by disease or infirmity from age, that it has suddenly cleared up before death, and the person has unexpectedly shown a disposing capacity. In *Durnell* v. *Corfield* (Prerog. Court, July, 1844), where an old man of weakened capacity had made a will in favour of his medical attendant, Lushington held that there must be the clearest proof not only of the *factum* of the instrument, but of the testator's knowledge of its contents (*Law Times*, July 27th, 1844). In *West* v. *Sylvester* (November, 1864), Wilde, J., in pronouncing judgment against a will propounding as that of the deceased, an aged lady, said:—"At the time she executed the will of October, 1863, although for many purposes she might be said to be in her right senses, she was nevertheless suffering from that failure and decrepitude of memory which prevented her from having present to her mind the proper objects of her bounty, and selecting those whom she wished to partake of it."

Another judge says:—"Another condition may be noticed, which often occurs in the experience of lawyers, and to which medical gentlemen in attendance on aged persons do not sufficiently attend. A person's mind in extreme old age may be quite intelligent, his understanding of business clear, his competency to converse upon and transact such undoubted, and his bodily strength good; but there may grow upon him such a fear and dread of relatives or servants who may have surrounded him, and on whom he may have become perfectly dependent, and his nervous system is wholly overcome, and he becomes a mere child and tool in the hands of those about him, so that he has no power to exert his mind in opposition to their wishes, or to resist their importunities. His mind is enslaved by his fears and a feeling of helplessness, so that to that extent, and in matters in which he may be moved by them, he really is facile and imbecile. This state of things seems to be easily brought on in old age, when the faculties are otherwise entire and the bodily strength considerable." This condition of mind at a great age (ninety-three or ninety-four) was exhibited in a remarkable manner in a case from Scotland, which went to the House of Lords (*Cairns* v. *Marienski*).

If a medical man be disinterested he may be of infinite service to the case.

On those occasions, when the medical attendant takes a direct benefit under the will of the dying person, the court looks very closely to all the circumstances connected with the drawing up and signing of the will. A medical man who takes any active part under these circumstances justly lays himself open to censure, and at the same time the will will most probably be set aside on the ground of undue influence, for it must be borne in mind that the medical attendant

comes very much under the category of a trusted friend, nurse, and adviser, and but little pity can be extended to anyone who abuses this position.

A case of this sort occurred a few years ago, the medical man had to refund the money and pay expenses of the suit. The evidence tended to show that the medical man was rather hardly dealt with, but trustees must expect to be dealt with very rigorously. One can only say that if a medical man expects to benefit under the will of a patient with whom he is on familiar terms, he should take care to get totally disinterested lawyers to intervene in order that his (the medical man's) action may be above suspicion (*Radcliffe* v. *Price*, Chanc. Div., March, 1902, *vide Lancet*, 1, 1902, p. 902).

F. **Suicide and Will Making.**—The act of suicide is often hastily assumed to be evidence of insanity; but it would not be allowed as a proof of this state, even when a testator destroyed himself shortly after the execution of his will. A case has been decided where the testator committed suicide three days after having given instructions for his will; but the act was not admitted as a proof or even as a presumption of insanity at the time, and the will was pronounced to be valid. A case has been decided on similar grounds in the French courts. In *Edwards* v. *Edwards* (Prerog. Court, February, 1854), it was proved that the testator had committed suicide three days after the execution of his will, and there was some evidence of eccentric habits almost amounting to insanity; but the will was pronounced to be valid. Suicide is not deemed in law to be a proof of the existence of insanity (*vide* Sect. XII., "Suicide").

G. **Wills in Extremis.**—Wills made by persons whose capacity during life has never been doubted, while lying at the point of death, or, as it is termed, *in extremis*, are justly regarded with suspicion, and may be set aside according to the medical circumstances proved. Many diseases, especially those which affect the brain or nervous system directly or indirectly, are likely to produce a dulness or confusion of intellect, under which a disposing power is lost.

In the case of *Whyddon* v. *Billinghurst* (Prerog. Court, July, 1850), a will was set aside because it was executed by the testatrix while labouring under an attack of cholera in September, 1849, and proper means had not been taken to test the capacity of the deceased, who at the time of its execution was reduced to such an extreme state of weakness that her mental powers were affected. In *Maxwell* v. *Maxwell* (Prob. Court, July, 1872), the validity of a will was contested on the ground that the testator was at the time labouring under gastric fever. It was attested by the medical attendant and the solicitor, both of whom deposed to the competency of the testator, *i.e.* that the disease had not reached that point to affect the brain or disturb the mind. In all cases of this nature *integritas mentis non corporis sanitas exigenda est.*

Delirium sometimes precedes death, in which case a will executed by a dying person would be at once pronounced invalid. In *Winstone* v. *Owen*

(Prob. Court, Nov., 1871), the testator made his will when on his deathbed.

His medical attendant took his instructions, and shortly after a solicitor drew up the will from them. The medical attendants and the solicitor attested the will, but it was alleged that, although conscious when instructions were given, the testator was unconscious when the will was executed. The solicitor thought he was quite unconscious at the time of execution. The doctor and the nurse thought he was conscious.

Lord Penzance said the law required not only that a man should be conscious, but that he should have a sound and disposing mind. The party propounding the will was bound to establish this, and having failed to do so, he must pronounce against it (*Med. Times and Gaz.*, 1871, 2, p. 605). It would appear from the evidence in this case that the will was signed within *ten minutes* of the time at which the testator was known to have lost his consciousness. His property was bequeathed to the defendant—a stranger. The deceased at the time of signing the will said nothing, did no act, and made no movement to indicate that he was distinctly aware of what he was doing.

In *Munro* v. *Lawson* (Prob. Court, January, 1870), the plaintiff, who was a relation of the husband, propounded the will of a lady, æt. 76. He took her instructions, and the will was drawn up in his own favour. It was proved by the medical man that the testatrix had died from apoplexy, that she was at the time of signing the will exhausted by illness and the near approach of death, and at the date of signing it was incompetent.

Lord Penzance said the result of the testimony was that on the day of the execution of the will the deceased retained in some measure her consciousness, but it was very doubtful whether she had sufficient capacity to make a good will. The will in question was made by the person who was benefited by it; no one else was present when the instructions for it were given, and he did not even take the precaution of reading it over in the presence of the witnesses. Even if she had been in full possession of her faculties at the time, the court must have felt some doubt whether she was fully aware of the contents of the will when she signed it. But it was evident that she was in a state of great physical prostration, and her capacity was very doubtful. The plaintiff had failed to satisfy the court that the deceased knew and approved the contents of the will, and the court therefore pronounced against it, and condemned the plaintiff in costs.

In examining the capacity of a person under these circumstances, we should avoid putting leading questions, namely, those which suggest the answers "yes" or "no." Thus, a dying man may hear a document read over, and affirm, in answer to such a question, that it is in accordance with his wishes, but without understanding its purport. This is not satisfactory evidence of his having a disposing mind: we should see that he is able to dictate the provisions of the document, and to repeat them substantially from memory when required. If he can do this accurately, there can be no doubt of his possessing complete testamentary capacity. But it may be objected that many dying men cannot be supposed capable of such an exertion of memory; the answer is then very simple: it is best that the person should die without a will, and his property be distributed according to the law of intestacy.

Criminal Responsibility of Lunatics.

Synopsis.

Legal dicta.
- Right and wrong.
- Jury's verdict final on fact.

The plea in cases of poisoning.

Points in determining lunacy.
- Family history.
- Personal history, including epilepsy.
 puerperium.
 delusions.
- Surroundings of the crime.
 - Accomplices.
 - Motive.
 - Who is the victim?
 - Subsequent conduct.

Summary and cases.

Responsibility here signifies nothing more than liability to punishment for crime, and a criminal act implies the existence of intention, will, and malice (Stephen). When insanity has reached a certain stage or degree, an act may be perpetrated without malice; and in this sense the person is considered to be irresponsible in law. This is a question of *fact*, to be determined by a jury from the whole evidence set before them; and the proof rests with those who make the allegation that the act in question, whether murder or arson, was not done wilfully or maliciously. "The sanity of a man's conduct," observes Stephen, J., "involves the presence of intention and will on all ordinary occasions; and if the act is one of those which the law forbids, it is presumed to be malicious and wicked" ("Crim. Law of Eng.," p. 89). This subject is of considerable importance in a medico-legal view; for should a plea of insanity be improperly admitted in any criminal case, then punishment is made to fall unequally on offenders: and if, on the other hand, it be improperly rejected, punishment is administered with undue severity. The rule of law on this subject is that no man is responsible to the law like a sane person for any act committed by him while in a state of insanity. The plea may be raised by the defence on any indictment, from the smallest offence up to murder; but it is rarely made a defence in smaller offences, because the close confinement to which an accused person, if found insane, would necessarily be subjected, would often be a heavier punishment than that which the law actually prescribes for the offence which he may have committed.

In a case of felonious assault, it was urged in defence that the prisoner was insane; but the evidence on this point was not by any means conclusive, when it was intimated by the court that, if the plea were admitted, the party would probably undergo a much longer imprisonment than if on conviction he received the legal punishment for the offence (*Reg.* v. *Reynolds*, Bodmin Aut. Ass., 1843). The judge said that there was no proof of insanity. If the prisoner was pronounced insane, he might be imprisoned for life, and therefore he did not think *that* finding would benefit him. A verdict of guilty was returned, and the man was sentenced to eighteen months' imprisonment.

Making the plea of insanity a question of expediency dependent on the amount of punishment for the offence, must be pronounced unsafe

and indefensible. Murder, incendiarism, and theft are the crimes for which the plea of insanity is commonly raised.

Legal Considerations and Dicta.

We look in vain through legal literature for any codification of the law upon this subject; but in a work on medical jurisprudence it is necessary to consider how much light the law does throw on it.

The first attempt made by the law to deal with the subject is thus spoken of by Dr. Taylor in former editions of this work.

Singularly enough, in no single instance has the Court for Crown Cases Reserved, or any other court sitting in banco, delivered a considered written judgment on the relation of insanity to criminal responsibility, though there are several such decisions as to the effect of insanity on the validity of contracts and wills (Stephen). Moreover, every judgment delivered during the last fifty years has been founded upon an authority in many ways doubtful, namely, the answers given by the judges to questions put to them by the House of Lords, in consequence of the acquittal of McNaghten on the ground of insanity, in 1843. Stephens, J., is of opinion that the authority of the answers is questionable, and that they leave untouched the most difficult questions connected with the subject ("Hist. of Crim. Law of Eng.," vol. 3, p. 154). The questions and answers are as follows. Fourteen of the fifteen judges consulted joined in the answers.

Question I.—"What is the law respecting alleged crimes committed by persons afflicted with insane delusions in respect of one or more particular subjects or persons, as, for instance, where, at the time of the commission of the alleged crime, the accused knew he was acting contrary to law, but did the act complained of with a view, under the influence of insane delusion, of redressing or revenging some supposed grievance or injury, or of producing some supposed public benefit?"

Answer I.—"Assuming that your Lordships' inquiries are confined to those persons who labour under such partial delusions only, and are not in other respects insane, we are of opinion that, notwithstanding the accused did the act complained of with a view, under the influence of insane delusion, of redressing or revenging some supposed grievance or injury, or of producing some public benefit, he is nevertheless punishable, according to the nature of the crime committed, if he knew at the time of committing such crime that he was acting contrary to law, by which expression we understand your Lordships to mean the law of the land."

Question II.—"What are the proper questions to be submitted to the jury when a person, afflicted with insane delusions respecting one or more particular subjects or persons, is charged with the commission of a crime (murder, for instance), and insanity is set up as a defence?"

Question III.—"In what terms ought the question to be left to the jury as to the prisoner's state of mind at the time when the act was committed?"

Answers II. and III.—"As these two questions appear to us to be more conveniently answered together, we submit our opinion to be that the jury ought to be told in all cases that every man is presumed to be sane, and to possess a sufficient degree of reason to be responsible

for his crimes, until the contrary be proved to their satisfaction. That to establish a defence on the ground of insanity, it must be clearly proved that at the time of committing the act the accused was labouring under such a defect of reason from disease of the mind as not to know the nature and quality of the act he was doing, or, if he did know it, that he did not know that he was doing what was wrong. The mode of putting the latter part of the question to the jury on these occasions has generally been, whether the accused at the time of doing the act knew the difference between right and wrong; which mode, though rarely, if ever, leading to any mistake with the jury, is not, we conceive, so accurate when put generally and in the abstract, as when put with reference to the party's knowledge of right and wrong in respect to the very act with which he is charged. If the question were to be put as to the knowledge of the accused, solely and exclusively with reference to the law of the land, it might tend to confound the jury by inducing them to believe that an actual knowledge of the law of the land was essential in order to lead to a conviction; whereas the law is administered on the principle that every one must be taken conclusively to know it without proof that he does know it. If the accused was conscious that the act was one which he ought not to do, and if that act was at the same time contrary to the law of the land, he is punishable, and the usual course therefore has been to leave the question to the jury, whether the accused had a sufficient degree of reason to know he was doing an act that was wrong; and this course we think is correct, accompanied with such observations and corrections as the circumstances of each particular case may require."

Question IV.—"If a person under an insane delusion as to existing facts commits an offence in consequence thereof, is he thereby excused?"

Answer IV.—"The answer must of course depend upon the nature of the delusion, but making the same assumption as we did before, namely, that he labours under such partial delusion only, and is not in other respects insane, we think he must be considered in the same situation as to responsibility as if the facts with respect to which the delusions exist were real. For example, if under the influence of his delusion he supposes another man to be in the act of attempting to take away his life, and he kills that man, as he supposes in self-defence, he would be exempt from punishment. If his delusion was that the deceased had inflicted a serious injury to his character and fortune, and he killed him in revenge for such supposed injury, he would be liable to punishment."

It would thus appear that the law, in order to render a man responsible for a crime, looks for a *consciousness of right and wrong, and a knowledge of the consequences of the act;* while the administration of justice rests on the principle that every one knows the law and fears its punishment.

On impulsive mania, Stephen, J., thus comments:—

"It is said that on particular occasions men are seized with irrational or irresistible impulses to kill, to steal, or to burn, and under the influence of such impulses they sometimes commit acts which would otherwise be most atrocious crimes. It would be absurd to deny the possibility that such impulses may occur, or the fact that they have occurred and have been acted on. Instances are given

in which the impulse was felt and resisted. The only question which the existence of such impulses can raise in the administration of criminal justice is, whether the particular impulse was really *irresistible* as well as *unresisted*. If it was irresistible, the person accused is entitled to be acquitted, because the act would not then be voluntary and not properly his act. If the impulse was resistible, the fact that it proceeded from disease would be no excuse at all. If a man's nerves were so irritated by a baby's crying that he instantly killed it, his act would be murder; it would not be less murder if the same irritation and corresponding desire were produced by some internal disease. The great object of the criminal law is to induce people to control their impulses; and there is no reason why, if they can, they should not control insane as well as sane impulses. The proof that an impulse was irresistible depends on the circumstances of the particular case. The commonest and strongest cases are those of women who, without motive or concealment, kill their children after recovery from childbed" (puerperal mania) ("Crim. Law of Eng." p. 95).

As regards the legal view of insanity, in its bearings upon crime, Stephen, J., has also summed up a description of madness in some of its other aspects as known to the law, in the following terms (Stephen's "Hist. of the Crim. Law of England," vol. 2, p. 145) :—

"Any one or more of numerous causes may produce diseases of the brain or nervous system which interfere more or less with the feelings, the will, and the intellect of the persons affected. Commonly, the disease, if it runs its full course, affects the emotions first, and afterwards the intellect and the will. It may affect the emotions either by producing morbid depression or by producing morbid excitement of feeling. In the first, which is much the commoner of the two cases, it is called melancholia, and in the second mania. Melancholia often passes into mania. Both melancholia and mania commonly cause delusions or false opinions as to existing facts, which suggest themselves to the mind of the sufferer as explanations of his morbid feelings. These delusions are often accompanied by hallucinations, which are deceptions of the senses. Melancholia, mania, and the delusions arising from them, often supply powerful motives to do destructive and mischievous acts; and cases occur in which an earnest and passionate desire to do such acts is the first and perhaps the only marked sympton of mental disease. It is probable that in such cases some morbid state of the brain produces a vague craving for relief by some sort of passionate action, the special form of which is determined by accidental circumstances; so that such impulses may differ in their nature and mode of operation from the motives which operate on sane and insane persons alike. The difference may be compared to the difference between hunger prompting a man to eat, and the impulse which, when he suffers violent and sudden pain, prompts him to relieve himself by screaming. Insanity affecting the emotions in the forms of melancholia and mania is often succeeded by insanity affecting the intellect and the will. In this stage of the disease the characteristic symptom is the existence of permanent incurable delusions, commonly called monomania. The existence of any such delusion indicates disorganisation of all the mental powers, including not only the power of thinking correctly, but the power of keeping before the mind and applying to particular cases general principles of conduct. The last stage of insanity is one of utter feebleness, in which all the intellectual powers are so much prostrated as to reduce the sufferer to a state of imbecility. Lastly, paralysis and epilepsy are so closely allied with insanity, that insanity frequently forms a symptom of each. In all the cases above referred to the sufferer is supposed to have been originally sane, but sanity may never be enjoyed at all. This happens in cases of idiocy."

The same able writer points out in graphic language the chief points on which medical and legal writers differ respecting the plea of irresponsibility ("Hist. of Crim. Law of Eng.," vol. 3, ch. xvii.); and this chapter should be perused by all physicians who have to deal with insane criminals. It may be well to give an outline of the views therein expressed.

"The different legal authorities" (he says, p. 125) "upon the subject have been right in holding that the mere existence of madness ought not to be an excuse

for crime, unless it produces in fact one or the other of certain consequences." The English law with respect to madness is thus stated, the doubtful points being placed within square brackets :—"No act is crime if the person who does it is at the time when it is done prevented, [either by defective mental power or] by any disease affecting the mind, (*a*) From knowing the nature or quality of his act, or (*b*) From knowing the act is wrong, [or (*c*) From controlling his own conduct, unless the absence of the power of control has been produced by his own default]. But an act may be a crime although the mind of the person who does it is affected by disease, if such disease does not in fact produce upon his mind one or other of the effects above mentioned in reference to the act." Speaking of knowledge of right and wrong, he says :—"I think that any one would fall within that description (inability to know the quality of his act) who was deprived, by disease affecting the mind, of the power of passing a rational judgment on the moral character of the act which he meant to do" (p. 163). And again :—"Knowledge and power are the constituent elements of all voluntary actions, and if either is seriously impaired, the other is disabled. It is as true that a man who cannot control himself does not know the nature of his acts as that a man who does not know the nature of his acts is incapable of self-control" (p. 171).

Opinions of Judges.—Stephen's opinion on these questions seems more than justified. We may now in approximately chronological order give the opinions of some of the individual judges on the matter.

The chronological order is chosen for the reason that it is obvious to the most casual observer of the order of things in England, that during the last twenty or thirty years aversion to capital punishment has sprung up, and has been increasing to such an extent, that it is to be feared that it is now a large factor in the mind of the criminal classes when it reflects, as it probably does, on the pros and cons of committing a crime.

So far back as 1843, Gurney, B., in the case of *Rex* v. *Reynolds*, said that—

"The defence of insanity had lately grown to a fearful height, and the security of the public required that it should be closely watched."

So also Coltman, J., in the case of *Reg.* v. *Weyman*, remarked that—

"The defence of insanity was one which was to be watched with considerable strictness, because it was not any slight deviation from the conduct that a rational man would pursue under a given state of circumstances, which would support such a line of defence. In more recent cases it has been resorted to simply because apparently every other defence was shut out by the evidence."

In 1844, on a trial for arson in Scotland (*R.* v. *Gibson*), Lord Justice-Clerk Hope directed the jury to deal with the case according to the views laid down by the judges of England (*supra*).

He considered that the insanity to be proved as a ground of exemption must be total—*i.e.* "the disorder must amount to an absolute alienation of reason. . . . No such principle is recognised in law as that a man, allowing a fancy or morbid feeling to get possession of his mind and temper, although it *disturbs* reason while it does not *overthrow* it, will escape punishment, because, instead of resisting the temptations of such ill-regulated, morbid, distempered, and ungovernable feelings and prejudices (whether called delusions or not), he gives way to them and indulges in their gratification and satisfaction." These remarks, it will be seen, apply to the plea of insanity in general; and he remarked, with respect to the knowledge of right and wrong: "A man must believe, not that the crime is wrong in the abstract (for most madmen do admit murder to be wrong and punishable in the abstract), but that *the particular act*, committed under the influence of the motive which seems

to have prompted it, was not an offence against the law. One may know that in the abstract the act is punishable, and yet believe that his particular act is not in law a crime and not punishable."

From these extracts it will be perceived that the law of Scotland, in reference to the plea of insanity in criminal cases, is substantially the same as that of England.

In the same year and for a similar crime, arson (*R.* v. *Enderfield*), Gurney, B., left it to the jury to say, not whether the prisoner had a weak or silly mind, but whether at the time he committed the act he was in such a state of mind as to know what he was about, and to be capable of distinguishing between right and wrong. The prisoner was acquitted on the ground of insanity. In another case (*Reg.* v. *Watts*, Norwich Wint. Ass., 1844), the plea was negatived under the direction of the judge.

In the year 1850, in a trial for shooting at the Queen, Alderson, B., observed, in charging the jury,

That it was not because a man was insane that he was unpunishable; and he must say that upon this point there was generally a very grievous delusion in the minds of medical men. The only insanity which legally excused a man for his acts was that species of delusion which conduced and drove him to commit the act alleged against him. They ought to have proof of a formed disease of the mind, a disease existing before the act was committed, and which made the person accused incapable of knowing, at the time he did the act, that it was a wrong act for him to do.

The prisoner was convicted.

In 1860 (*Reg.* v. *Roberts*, Maidstone Wint. Ass., 1860), Bramwell, B., put the question of responsibility for arson in a still stronger light. Addressing the prisoner, who had pleaded guilty, he said:

"That you are of unsound mind I believe, but that is no reason why you should not be punished. I address the explanation of the reasons why I pass upon you the sentence which I am about to pronounce, not so much to your understanding as to those around who hear me, and to those whose duty it is to notice them. The law makes unsoundness of mind no excuse for offences, except it were such that you did not at the same time know the nature of what you were doing, and that it was wrong and unlawful. No doubt it is very unfortunate that persons of unsound mind should become by that affliction less under the influence of moral restraints and of the restraints of law; but it would be sad indeed for the public if, when those restraints are weakened, the protection of the law were to be withdrawn by the extension of impunity to crime. I am not sure that it is not more necessary to punish a madman than a sane man, so far as the protection of the public is concerned. I feel bound to sentence you to the same punishment as if you were sane."

In 1862, in *Reg.* v. *Burton* (Maidstone Lent Ass., 1862), Byles, J., Observed that even the existence of mental disease did not necessarily exempt a person from criminal responsibility. Many a man whose mind is in an unsound state knows perfectly well whether he is doing wrong; and so long as he knows *that*, he is subject to the criminal law. Even morbid delusion cannot always be allowed to screen a criminal from the consequences of his own acts, while there are instances in which a plea of insanity may properly be allowed, although no such delusion can be proved. Each case must be taken with its circumstances, and legal theories of insanity are chiefly valuable, not as rigorous axioms of law, but as cautions to be observed by the jury.

In 1863, a crime of very atrocious character was committed in which the plea of insanity was made. The report of the case is as follows (*R.* v. *Townley*, Derby Ass., 1863).

In reference to this defence of insanity, Martin, B., said: "If the prisoner knew that the act he was committing would probably cause death, and that

the doing of it would subject him to legal punishment, there was criminal responsibility."

Counsel for the prisoner:—"Many men have been acquitted with approval who must have been convicted under such a direction."

Martin, B.—"I have drawn that from a summing-up of Justic Le Blanc, which has been much approved of, and from a decision of Lord Denman and another of Lord Lyndhurst, and I believe it to be a correct statement of the law. I have put aside from my consideration the ruling of the judge who tried Bellingham, because that ruling has been objected to."

The charge of the judge embraced nearly all the contested points involved in the medical theories of homicidal or impulsive insanity, and it will serve to show that the evidence for the defence failed to prove the existence of insanity at the time of the act, upon any reasonable or even probable grounds consistent with the administration of the law and the due protection of society. Martin, B., said:—"So far as the act of murder was concerned, it was the clearest case he had ever had the misfortune to try. It was plain that the prisoner had suffered (from his rejection by the deceased) as much as probably any man ever had suffered; but it was equally clear that he did not appear to be insane in the eyes of the landlady of the Bull's Head, or in those of Mr. Harris. The prisoner soon afterwards went to the Hall, and remainded in the company of the young lady from half-past six to nearly nine o'clock, when the deed was committed. It is probable that he implored her to renew the engagement, and perhaps reproached her with her conduct towards him; he then inflicted upon her the wounds which had caused her death. That was murder subject only to the question of insanity. No one could doubt that the prisoner knew what he was doing, and that his act would cause death. Unless he was insane therefore, under such circumstances he was guilty of murder. No word was more vague than insanity. Probably there was not one of the jury but was acquainted with some man who was in the habit of doing extraordinary things, and of whom people said, "Why, that man must be insane." Two years ago an investigation took place into the condition of mind of a gentleman from the eastern parts of the country. There was a long inquiry, which excited great public interest, and there was a great divergence of opinion among medical men. Great eccentricity of conduct on the part of that person was shown, yet there was nothing to relieve him from criminal responsibility. Probably he was not the wisest of men, yet he was of sufficient intellect to take care of himself and avoid doing injury to others. There was a somewhat similar case at the last Gloucester Assizes, in which a young lady was under the impression that a number of ladies had formed an unfounded dislike to her. In all probability she was labouring under a delusion with respect to these persons, yet she was as subject to the criminal law as any one in that court. *What the law meant by an insane man was a man who acted under a delusion, and supposed a state of things to exist which did not exist, and acted thereupon.* A man who did so was under a delusion, and a person so labouring was insane. In one species of insanity the patient lost his mind altogether, and had nothing but instinct left; such a person would destroy his fellow-creatures, as a tiger would his prey, by instinct only. A man in this state had no mind at all, and therefore was not criminally responsible. The law, however, went further than that. If a man labouring under a delusion did something of which he did not know the real character, something of the effect and consequences of which he was ignorant, he was not responsible. An ordinary instance of such a delusion was where a man fancied himself a king and treated all around him as his subjects. If such a man were to kill another under the supposition that he was exercising his prerogative as a king, and that he was called upon to execute the other as a criminal, he would not be responsible. The result was, that if the jury believed that at the time the act was committed the prisoner was labouring under a delusion, and believed that he was doing an act which was not wrong, or of which he did not know the consequences, he would be excused. If, on the other hand, he well knew that his act would take away life, that that act was contrary to the law of God and punishable by the law of the land, he was guilty of murder. That was the real question they had to try. He had already stated his opinion that the law upon the subject had been best laid down by Justice Le Blanc, as able a judge as ever sat on the Bench. Justice Le Blanc, in the case alluded to, observed to the jury that it was for them to determine whether the prisoner when he committed the offence with which he stood charged was incapable of distinguishing right from wrong, or under the influence of any delusion which rendered his mind at the moment insensible of the

nature of the act he was about to commit—since in that case he would not be legally responsible for his conduct. On the other hand, provided they should be of opinion that when he committed the offence he was capable of distinguishing right from wrong, and not under the influence of such a delusion as disabled him from discerning that he was doing a wrong act, he would be amenable to the justice of his country and guilty in the eye of the law. That, in his (Baron Martin's) opinion, was a correct statement of the law. He should not allude to Bellingham's case, because many were of opinion that that was an unsatisfactory trial. In a more recent case the late Lord Lyndhurst told the jury that they must be satisfied, before they could acquit the prisoner on the ground of insanity, that he did not know, when he committed the act, what the effect of it, if fatal, would be. With reference to the crime of murder, the question was, did he know that he was committing an offence against the laws of God and nature? In Oxford's case Lord Denman said: "Something has been said about the power to contract and to make a will; but I think that those things do not supply any test. The question is, whether the prisoner was labouring under that species of insanity which satisfies you that he was quite unaware of the nature, character, and consequences of the act which he was committing; or, in other words, whether he was under the influence of a diseased mind, and was really unconscious at the time he was committing the act that it was a crime." The jury must judge of the act by the prisoner's statements, and by what he did at the time. Unless they were satisfied—and it was for the prisoner to satisfy them—that he did not know the consequences of his act, or that it was against the law of God and man and would subject him to punishment, he was guilty of murder. The prisoner's letters appeared to be the most sensible letters he had ever read. The reason the prisoner gave for his act was, "She should not have proved false to me." Now, if his real motive was that he conceived himself to have been ill-used, and if he committed the act either from jealousy of the man who was preferred to him, or from a desire of revenge upon her, that would be murder. These were the very passions which the law required men to control, and if the deed was done under the influence of these passions there was no doubt that it was murder. The prisoner's expression that he should be hanged for it indicated that he knew the consequences of his act. Another reason he gave for what he had done was, "The woman who deceives me must die!" If a young lady promised to marry a man and then changed her mind, it might be truly said that she deceived him; but what would be the consequences to society if men were to say that any woman who treated them in that way should die, and were to carry out these views by cutting her throat? The prisoner claimed to exercise the same power over a wife as he could lawfully exercise over a chattel, but that was not a delusion, nor even like a delusion. It was the conclusion of a man who had arrived at results different from those generally arrived at, and contrary to the laws of God and man, but it was no delusion. Evidence indeed had been given of an actual delusion in the prisoner's mind in supposing that there was a conspiracy against him. That was an apt and common instance of delusion. There was also evidence of insanity in the maternal line, and it was true that insanity was hereditary and did descend in families. The object of this was to show that it was possible and not unlikely that an hereditary taint might exist in the prisoner. All the evidence, however, failed to prove the existence of any delusion in the prisoner's mind which could explain this act. None of his family conceived him to be mad. It was clear that such an idea had not entered into their minds, or they would not have recommended him to go and see Miss Goodwin. They treated him as sane from beginning to end, and as a proper person to contract matrimony and re-engage the affections of this young woman. The account of his state of mind upon receiving her letters was most probably correct. Most men would probably suffer in the same way under similar circumstances. It had been said by one of the witnesses that the prisoner did not know the difference between good and evil. If that was a test of insanity, many men were tried who did not know that difference—in truth, it was no test at all. The idea of a conspiracy was a delusion, but the mere setting himself up against the law of God and man was not a delusion at all. The question for the jury was—Was the prisoner insane, and did he do the act under a delusion, believing it to be other than it was? If he knew what he was doing, and that it was likely to cause death, and was contrary to the law of God and man, and that the law directed that the person who did such acts should be punished, he was guilty of murder." The jury returned a verdict of *Guilty* of wilful murder.

In 1872 (*R.* v. *Jordan*) the prisoner was indicted for the murder of a child, whose throat he deliberately cut. There was no motive; he had previously borne an excellent character, and was very fond of children, and there was no evidence of mental disorder or intellectual insanity. His wife had deserted him some time before, and he had fallen into a state of great depression. Martin, B., is reported to have said:—

> Under such circumstances it was for the jury to consider whether it would be safe to convict the prisoner of murder. When such impulses came upon men, according to the medical evidence they were unable to resist them. It would be safe in such a case to acquit the accused on the ground of insanity.

The prisoner was acquitted on the ground of insanity.

From all the above the final legal *dictum* runs as follows: "To establish a defence on the ground of insanity, it must be clearly proved that at the time of committing the act the party accused was labouring under such a defect of reason from disease of the mind as not to know the nature and quality of the act he was doing, or, if he did know it, that he did not know he was doing what was wrong." On which, in 1885, Mr. Justice Hawkins remarked *apropos* of the trial of a man named Ware, who had been a patient in an asylum:—"It would be impossible to say that Ware did not know that he had killed a man, because he said himself that he had, and it would be impossible for anybody to urge that he did not know it was wrong, for he wanted a promise that he should not be punished, but unless one put a totally different construction on the law, *that* would have to be proved, although no man in his senses would suppose that any jury would find Ware responsible for what he had done."

As it is remarked in speaking of testimonial capacity (*supra*), nothing can be more incorrect than to apply one general term (*insanity*) to the conditions of all persons affected with mental disorder, and to pronounce them therefore all incompetent or all incapable, when common sense suggests that we are bound to inquire into the amount of capacity in each case. If, according to this ruling, we are always to insist upon distinct proof of a disease of the mind existing *before* the act committed, it is clear that an act perpetrated under a sudden access of insanity, by a person not previously labouring under delusions, would be punishable like that of a sane criminal. Wood repudiates the doctrine that an insane person is necessarily irresponsible, and therefore unpunishable: "All who have had the opportunity of studying insanity know full well that, with comparatively few exceptions, insane persons are not only powerfully influenced, but materially controlled, by the same motives which influence and control those who are still mixing in the world, and who have never been suspected of mental derangement" ("Plea of Insan.," p. 4).

The difference of opinion which exists between physicians and jurists in reference to this plea consists in this:—Most jurists aver that no degree of insanity should exempt from punishment for crime, unless it has reached that point *that the individual is utterly unconscious of the difference between right and wrong at the time of* committing the alleged crime. Physicians, on the other hand, affirm that this is

not a proper test of the existence of that degree of insanity which should exempt a man from punishment; that those who are labouring under confirmed insanity are fully conscious of the difference between right and wrong, and are quite able to appreciate the illegality as well as the consequences of their acts. Again, those who have patiently watched the insane for years, agree that the legal test of unconsciousness of right and wrong in the performance of acts would in reality apply only to persons who were suffering from delirium, from a furious paroxysm of mania, or from confirmed idiocy; and that if the rule suggested by Warren, that a person, in order to be acquitted on the ground of insanity, should be first proved to be as "*unconscious* of his act *as a baby*," were strictly carried out, there is scarcely an inmate of an asylum who destroyed a keeper or attendant, who might not be executed for murder. Such a rule amounts to a *reductio ad absurdum*; it would abolish all distinction between the sane and the insane, between the responsible and the irresponsible; and it would consign to the same punishment the confirmed lunatic and the sane criminal. This species of *baby-unconsciousness of action* exists in idiots as well as in furious maniacs, but not in the majority of lunatics; and it may be safely asserted that, if this criterion be the true one, acquittals on the ground of insanity have involved a series of gross mistakes. The only irresponsible lunatics, according to Warren, are precisely those who would not even have reason enough to plead to an indictment. Thus, while the medical profession is condemned for adopting opinions which would lead to the acquittal of criminals, this legal writer recommended a rule which would certainly lead to the execution of the greater number of confirmed lunatics charged with acts of homicide. The practical failure of such a rule is manifest when it is found that persons who have destroyed life with a perfect consciousness of the wrongfulness of their acts are frequently acquitted as insane. In the case of Dadd, who was acquitted on the ground of insanity, and who was proved to be a confirmed lunatic, it transpired that the man had actually provided himself with a passport, and fled to France, after destroying his father (see Wood, *op. cit.*, p. 41). It may be said that the consciousness of the insane is an insane consciousness, while the law implies the consciousness of a sound mind; but this involves a *petitio principii*. There have been numerous cases of acquittal in which, until the act of homicide was committed, there was no imputation either against the sanity or the sane consciousness of the accused.

An erroneous notion prevails that a homicidal lunatic is easily to be distinguished from a sane criminal by some *certain* and invariable symptoms or characters, which it is the duty of a medical witness to display in evidence, and of a medico-legal writer to describe. But a perusal of the evidence given at a few trials will show that each case must stand by itself. It is easy to classify homicidal lunatics, and say that in one instance the murderous act was committed from a motive —*e.g.*, of revenge; in a second from no motive, but from irresistible impulse; in a third from illusion or delusive motive—*i.e.*, mental delusion; in a fourth from perverted moral feeling without any sign of intellectual aberration. This classification probably comprises all the varieties of homicidal insanity, but it does not help

us to ascertain, in a doubtful case, whether the act was or was not committed by a person labouring under any of these psychological conditions. It enables us to classify those who are *acquitted* on the ground of insanity, but it entirely fails in giving us the power to distinguish a sane from an insane criminal, or a responsible from an irresponsible lunatic.

In connection with the above general considerations and with the judges' dicta above quoted there are two points to which attention must be especially directed, (1) the meaning to be attached to the words "right" and "wrong," and (2) the fact that if the prisoner be sane enough to plead the actual *fact* of a verdict "sane or insane" is left to the *opinion* of a jury.

Right and Wrong.—There is apparently a very sharp line of distinction between lawyers and medical men in the meanings they attach to these words; to the lawyer they mean nothing more nor less than lawful or unlawful, permitted or forbidden (under certain penalties) by the law of the land in which the act or word is done or spoken, a simplicity of meaning which the editor thinks might well be adopted by the medical profession, instead of the extremely vague idea "whether the act conforms or not to some very varying standard of morals and conduct, evolved from a mixture of religious dogma with a nebulous doctrine known as sociology." Parliament, as the supreme power in the land, has crystallised for us in the shape of laws the great bulk of the principles of sociology, and surely when these laws are codified into statutes it would be wiser to accept these as the basis of conduct; in fact, the existence of a nation as a united body seems to depend upon the observance of laws which have been agreed to by a majority; otherwise, if each may do what seems good in his own eyes the body politic of the people must disintegrate into jarring units with certain dissolution of the nation not far off.

It has been objected to the *legal test* that it is insufficient for the purpose intended: it cannot, in a large majority of cases, enable us to distinguish the insane homicide from the sane criminal. Many *insane persons* have committed acts which they knew to be wrong, and of the criminality of which they were at the time perfectly conscious. They have been known to murder others, in order to receive punishment of death at the hands of the law; and therefore they must have been conscious of the wrongfulness, or rather of the illegality, of the act which they were perpetrating, and have known that they were committing an offence against the laws of man.

The legal test of a knowledge of the nature of the crime, or of right and wrong, is a frequent cause of inconsistent and even conflicting verdicts. The case of *Reg.* v. *Westron* (C. C. C., February, 1856) furnishes a curious illustration of this:

> The prisoner was charged with the murder of Mr. Waugh. On some provocation, partly real and partly based on an exaggerated view of his rights, the prisoner shot the deceased in open day in a public thoroughfare. The only question therefore for the jury was the state of mind of the prisoner at the time of the act. It was proved that he was ill-tempered and violent about trifles; but he had an acute knowledge of business, and lived by himself in various lodgings. The persons with whom he had associated deposed that his conduct was so strange and unreasonable at times that they were glad to get rid of him as a lodger. Evidence was also given to the effect that several members of his family had been insane, and that the

prisoner himself three years previously had suffered from mental excitement, but it was not such as to render restraint necessary. The medical witnesses declined to say that the prisoner was in such a state of mind as to be incapable of knowing that the act of killing a man was wrong. Symnot properly observed that many lunatics would be perfectly well aware that such an act was wrong. On this it was contended, for the prosecution, that as the prisoner must have known what he was doing, he was fully responsible. The jury were, as usual, directed to decide whether the prisoner was proved to have been in such a state of mind, at the time the act was committed, that he did not know the nature and quality of the act, or the distinction between right and wrong.

Of course, upon the medical evidence the jury had no option but to find the prisoner guilty of "wilful murder," but they recommended him to mercy on account of an alleged "predisposition to insanity." This verdict was tantamount to "not guilty on the ground of insanity," and sentence of death was therefore simply recorded. Under such a verdict the judges appear to have felt that the usual punishment of death for wilful murder could not be carried out. The jury were bewildered by the test of guilt submitted to them: they appear to have considered the man insane, but that his insanity had not reached the legal standard of an entire absence of knowledge of right and wrong. The general history of the prisoner and his crime tended to show insanity, but there was no reason to believe that it had reached that point at which there is a loss of all knowledge of the nature and quality of an act perpetrated, or of its unlawfulness. On the contrary, the prisoner deliberately shot the deceased out of revenge for a supposed injury; his whole conduct showed that he knew the act was illegal, but he set the law at defiance. A man actuated by mere brutal recklessness could have done no more.

Some medical men think, if they discover a delusion in the mind of an accused person, that he is necessarily irresponsible; but the theory of the law as laid down by the judge in McNaghten's case (*ante*) is, that notwithstanding a person labours under a delusion, if he commits an act which he knows to be contrary to law, he is liable to punishment. Mayo observes that the very case which elicited this answer proves that the practice is not in accordance with theory: "The adequacy of McNaghten to comprehend the criminal nature of the homicidal act for which he was tried was unquestionable, yet he was acquitted on the plea of insanity, without the smallest reference to the conditions on which alone it is exculpatory, although they had been distinctly set forth as not complied with in the opening speech of the Attorney-General. The prisoner was pronounced to be insane by several medical witnesses, and on this evidence the judge stopped the case, and directed an acquittal, without going into the question whether the prisoner was or was not ignorant of the illegal nature of his act. In his address to the jury, he used the ambiguous expression of a knowledge of 'right and wrong' (not 'legal and illegal') as absent in McNaghten's mind" ("Med. Test.," p. 86). The terms "right and wrong," thus used, are certainly vague and undefined. If that which is legal is right, and that which is illegal is wrong, it would be only proper to discard the words, "of a knowledge of right and wrong," and place the question before the jury in accordance with the answers given by the judges in McNaghten's case, namely, whether the prisoner knew at the time of committing the act that

it was contrary to the law of the land. The test of responsibility assumed by it is purely theoretical, and such that it cannot be strictly carried into practice. With this admission it appears unnecessary to occupy space with metaphysical discussions regarding criminal responsibility: for however defective the rules—if the *practice* of the law be in any one case in conformity with that which has been advised by writers on the medical jurisprudence of insanity, although it may be adverse to the theory on which it is professedly based, that is all with which we have to concern ourselves—the principle is admitted. The great defect in the English law is, not that it will go even to the full extent of exculpating a person who has committed a crime with a full knowledge of its illegality, and under what may be called an "uncontrollable impulse," or an impulse which his reason was not sufficient to control, but the *uncertainty of its application*. The cases referred to show that an acquittal on the plea of insanity is on some occasions a mere matter of accident.

Opinion of the Jury.—There is nothing more certain than the uncertainty of the honest opinion of the individuals composing a jury, consequently there need be no surprise at the very varying verdicts which are returned as to the sanity or insanity of a criminal. It is not only the evidence that the jurymen have to weigh and consider, but the attitude and demeanour of the witnesses who give the evidence. These latter factors can never be expressed in print, and it is therefore permissible to assume that verdicts are perhaps not so wildly contradictory as may appear in merely reading reports of trials, but it is impossible to avoid the reflection that a jury is a most unsatisfactory body to decide the important question of the sanity of a criminal.

There can be no doubt that the strongest factor in the situation, and one which leads to many verdicts of "guilty but insane," is the nature of the punishment inflicted upon murderers; there is an innate and growing objection in the minds of jurymen to condemning a fellow creature to the revolting punishment of death by hanging with all its inevitably attendant details of cruelty, and so long as this remains the barbarous penalty of murder so long will skilful counsel be able to prejudice a jury most strongly in favour of a verdict of insane.

It is true that when the evidence of insanity is very strong indeed the judge can on his own responsibility stop the trial, but cases of such obvious nature hardly come under discussion in the ordinary sense of discussing criminal responsibility; they can only be considered in an argument for altering the method of execution from hanging to "lethal chamber while asleep," a subject as yet hardly within the horizon of practical politics, though one of profound interest, and one that the editor hopes may some day come to the front.

For the editor's personal opinion on the difficulty and the way out of it *vide B. M. J.*, September, 1904.

The Plea in Cases of Poisoning.

In Clifford Allbutt's "System of Medicine," vol. 8, pp. 438–457, is a very excellent article on criminal lunacy in England by David Nicolson, for some years medical superintendent of the Broadmoor Criminal Lunatic Asylum, an article which should be read by all interested in the subject.

It is there (p. 451) stated that out of 200 people executed seven paid the death penalty for poisoning, while of 200 found insane only two had used poison as a means of destruction. This bears out the statement made by Dr. Taylor many years ago that the defence of insanity in cases of murder by poison has generally ended in failure, although there may even have been proof of hereditary taint. (*Reg.* v. *Gallop*, Somerset Wint. Ass., 1844; and *Reg.* v. *Allnutt*, C. C. C., December, 1847.) The crime of poisoning indicates malice and deliberation in a greater degree than it would be in general safe to admit as coexisting with a state of irresponsible insanity. Alison, however, mentions one case of acquittal (Sparrow, 1829) in which this plea was admitted.

The woman poured a large quantity of oil of vitriol down the throat of her own child; she then ran to a neighbour's house in a state of evident derangement, saying that she had killed the devil. This was a case of demonomania; her insanity was proved, and she was acquitted. ("Crim. Law," p. 648.) In *Reg.* v. *Vyse* (C. C. C., July, 1862) the prisoner, a respectable woman, was charged with the murder of her two children, by poisoning them with strychnine. The act was done with great deliberation and forethought, the poison was purchased under false pretences, and there was an entire absence of motive. She was acquitted on the ground of insanity.

This was considered to be a case of impulsive mania, as there was nothing to indicate intellectual insanity. There was an hereditary tendency to insanity, coupled with the effects of prolonged nursing and general constitutional debility; but Hood's minute inquiries brought out facts which showed that the prisoner had laboured under disease which might have affected her mind, and have deprived her of the proper control of her actions. He stated that on his first visit to her in Newgate he learnt that during the later months of suckling she had been mentally overworked and subjected to great anxiety and fatigue. When worried by her business transactions she suffered from a painful sensation in the interior of the cranium, on the surface of the brain, and which she spoke of as "perspiring of the brain"—a symptom often complained of by patients who suffer from mental disease as giving a creeping, irritating feeling, but never more graphically described than by Mrs. Vyse. It is indicative of morbid action of the brain, which is manifested by examination after death. He considered Mrs. Vyse to be suffering from cerebral disease, which rendered her at the time of the murders an irresponsible agent.

The impulse to violence may be dormant for weeks or months, and then show itself by a suicidal or homicidal act; but such is the result and not the proof of mental disease. The case of Christiana Edmunds (*Reg.* v. *Edmunds*, C. C. C., January, 1872) is in this respect of some interest.

The woman, æt. 43, moving in a respectable sphere of society, was charged with the murder of a boy at Brighton on June 12th, 1871. The deceased ate some sweets purchased in a confectioner's shop, and died in a short time with the symptoms of poisoning with strychnine; and strychnine was found in his stomach. The prisoner had procured sweets from this shop by the agency of boys, and having deliberately poisoned them with strychnine, returned them to the shop. She had herself on various occasions left poisoned sweets about in shops. How many persons had suffered from this cold-blooded and reckless act is not known, but she had previously attempted to poison the wife of a medical man; and she imputed the poisonings to the carelessness of the confectioner. He was able to show that his sweets as purchased were wholesome, and by a chain of circumstances the crime of poisoning

them was clearly fixed upon the prisoner. She had shown much cunning in her proceedings. She had procured strychnine on four different occasions under false pretences, and had borrowed the poison-book of a druggist, and torn out the leaves to conceal the fact that she had purchased the poison.

The defence was insanity, but there was no proof of intellectual insanity. She had shown all the skill of an accomplished criminal in carrying out her plan of general poisoning, and in using the most artful means to conceal it and to throw the imputation upon the confectioner. Impulse could hardly be pleaded, for her criminal acts were extended over weeks and months. She was convicted. She then, with a view of averting or delaying punishment, put in a false plea of pregnancy in bar of execution. The capital sentence was subsequently commuted, and the prisoner was sent to Broadmoor Asylum on the statement that she was of unsound mind.

It appears that her father had died in a lunatic asylum when of middle age, having suffered for years before his death from homicidal and suicidal mania; her brother died at Earlswood Asylum, an epileptic idiot; her grandfather was a subject of cerebral disease; her sister suffered from hysteria; other relations were afflicted with nervous diseases of some kind; and she herself appears to have exhibited, some eighteen years before, symptoms of hysteria and hysterical paralysis. (*Lancet*, 1872, 1, pp. 89, 107, 734; and *Med. Times and Gaz.*, 1872, 1, pp. 71, 100, 111.) This proved hereditary tendency to insanity in her family was the main cause of the commutation of the capital sentence. If we except the nature of the crime, showing as it did an utter recklessness for human life, there was nothing to indicate unsoundness of mind either in a medical or a legal sense in this woman. The only evidence of insanity would be the atrocity of the act itself; but on this ground Mary Ann Cotton, executed at Durham for murder by poison, might have equally been pronounced insane. There was evidence that this woman had destroyed with arsenic, in the most reckless manner, children, husband, relatives, and friends, to the number of twenty persons. She sent her son, for whose murder she was tried, to procure the poison with which she subsequently killed him; but this woman was condemned and executed. She could not plead hereditary taint nor hysteria of ancient date.

Points which Help in Deciding as to the Sanity or Insanity of a Criminal.

In a work on medical jurisprudence it would be obviously out of place to discuss these at all fully. At the same time it is impossible to pass them by entirely without notice.

There are three directions in which evidence of the insanity of a criminal may be sought:

1. In his family history.
2. In his personal history at the time of and previous to the offence.
3. In the surroundings of the offence itself.

1. **Family History.**—This has been already sufficiently discussed; *vide* pp. 819 *et seq.*

2. **Previous Personal History.**—There is at least an equal amount of discretion required here, in judging how far the actions of the accused previous to his offence indicate lunacy. If we exclude congenital cases (imbecility, epilepsy from birth, etc.), one has only to draw attention to the fact that we judge of "acquired lunacy" by a *change* in character to show that it may be argued that the crime *constituted the change*, and further to show the difficulty of arriving at a just conclusion. Moreover, the subject of impulsive insanity is a great stumbling-block (*vide* p. 806): delusions may have been carefully concealed until the commission of the crime brings them to the front. (For further discussion *vide* Allbutt, 8, p. 248, etc.; also "Suicide," Sect. XII.)

If it can be definitely shown that the accused was at some previous period in his life confined in an asylum, or very obviously insane, then the question of recurrent insanity with lucid intervals is at once raised. Such a form is undoubtedly recognised and exists, and forms, in the editor's opinion, a very strong argument in favour of the statement that lunacy is never cured, in the sense that a recurrence of the social stress can be guaranteed not to reproduce the mental breakdown.

In connection with the personal history the three following troubles —viz., epilepsy, the puerperium, and delusions—stand out in considerable relief.

Epilepsy.—Epilepsy is undoubtedly due to disorder of the brain, and is hence regarded as only one branch of the tree of insanity. The existence of epilepsy in an individual will not, however, be regarded as rendering its subject irresponsible for his acts unless it can be clearly shown that the disease is of such a kind as to bring the person into conformity with the legal tests elsewhere laid down.

Epilepsy varies greatly in degree: it may be so slight as to allow its subject to ostensibly fulfil all the duties of life in the usual manner; or it may gradually lead to entire degeneration of the mind; or it may cause the sufferer to be at times maniacal. It is common, too, to meet with cases in which, immediately before or immediately after a fit, an outburst of uncontrollable fury of the most destructive kind takes place (Savage). But it is doubtful whether, if an epileptic commits a crime long after a preceding fit, and the crime is not soon followed by a fit, the person should be regarded as irresponsible. This question was raised in the case of *Reg.* v. *Wood* (Lewes Ass., April, 1892), where the prisoner, a man æt. 29, had committed a rape on a young child, and then throttled her. Evidence was given of "fits" at the age of two years, in one of which he foamed at the mouth and bit his tongue. There was no evidence of any seizure between this date and the commission of the crime, when he was very drunk. Twenty days later, and when he had already been eighteen days in custody, he had a fit, which was pronounced by Ross to be genuinely epileptic. Saunders gave evidence in favour of the prisoner's irresponsibility; but the prisoner was convicted.

To be satisfactory as evidence of irresponsibility, not only should definite fits be proved to have occurred previous to the commission of the crime, but these fits should also be proved to have produced *marked* mental deterioration in their subject.

Puerperal Mania.—Women who have been recently delivered are liable to sudden attacks, in which a disposition to murder their offspring is the most marked symptom. This has long been known and recognised by physicians as "peurperal mania." The disorder seldom attacks a woman before the third day—often not for a fortnight, and in some instances not until several weeks after delivery. Out of ninety-two cases, Simpson observed that the attack occurred in twenty-one, between the fifth and fifteenth day (*Med. Times and Gaz.*, 1860, 2, p. 201). The most frequent period is at or about the commencement of lactation, and between that and the cessation of the uterine discharges (lochia). The *symptoms* do not differ from those of mania generally, but it may assume any of the other forms of insanity; and in one-half of the cases, it may be traced to hereditary tendency.

According to Burrows, there is delirium, with a childish disposition for harmless mischief. The woman is gay and joyous, laughing, singing, loquacious, inclined to talk obscenely, and careless of everything around. She imagines that her food is poisoned; she may conceal the suspicion, and merely avoid taking what is offered to her. She can recognise persons and things; and can, though perhaps she will not, answer direct questions. Occasionally there is great depression of spirits, with melancholia. These facts are of some importance in reference to cases of alleged child-murder. This state may last a few hours, or for some days or weeks. The murder of the child is generally either the result of a sudden fit of delirium, or a sudden impulse, with a full knowledge of the wickedness and illegality of the act; so that the legal test of responsibility of a knowledge of right and wrong cannot be applied to such cases, except on the assumption that insanity already exists and taints the consciousness of the individual. Women have been known to request the attendants to remove the child, but have afterwards taken an opportunity to destroy it. Such cases are commonly distinguished from deliberate child-murder by there being no motive, no attempt at concealment, nor any denial of the crime on detection. Several trials involving a question of puerperal mania have been decided, generally in favour of insanity. Among these is that of *Reg.* v. *Ryder* (C. C. C., March, 1856). There was an entire absence of motive in this as in most other cases of a similar kind. The mother was much attached to the child, and had been singing and playing with it on the morning of its death. She destroyed the child by placing it in a pan of water in her bedroom. The medical evidence proved that she had been delivered about a fortnight previously—that she had had an attack of fever, and that she had probably committed the act while in a state of delirium. She was acquitted on the ground of insanity: and Erle, J., remarked that it was evidently a case in which the insanity was only temporary, and the prisoner might be restored to her friends on a representation being made in the proper quarter. In most of these cases it will be found that women are fully aware of the nature of the act, and that it is contrary to the laws of God and man: they even make efforts to resist it, but they are unable to control their actions like persons in a normal state.

The following case, which occurred in 1904, is a good illustration of puerperal insanity, and also is one of those cases upon which the

editor relies in stating that it is never safe to expose a person who has been in an asylum to the strain that tends to lunacy.

In the Battersea Coroner's Court, Mr. John Troutbeck held an inquiry, early in 1904, as to the death of Annie Chance, aged nine weeks, daughter of a paperhanger, living at Trollope Street, Clapham, who died from the effects of injuries received through being thrown out of a window by her mother. The child's father stated that his wife since her confinement had complained of pains in her head. On Thursday morning he left her in bed with the baby, and ten minutes later met the landlady, who informed him that the child had been injured. Kate Keepence, the landlady, explained that, at 6.30 on Thursday morning she heard a peculiar noise in Mrs. Chance's bedroom, and on going upstairs was informed by her that she had dropped her baby out of the window. Witness found the infant in the garden, and took it to a doctor. Sub-Div. Inspector Hamilton, W Division, said that the woman had been certified as a lunatic, and was now in Banstead Asylum. The child died three hours after it was injured. Her skull was fractured in six places, and nine ribs were broken. It was added that the mother was extremely fond of her children, and that both she and her husband were teetotalers. The jury returned a verdict of wilful murder against Martha Ellen Chance.

The Presence of Delusions.—This comes very near to re-opening the whole question, for delusional insanity is, even by medical men, accepted as a more or less distinct class of insanity, and it is over delusions, *and their nature*, that almost all the differences of opinion between medical men and lawyers arise. The existence of a delusion, *if it can be definitely proved to be genuine*, is accepted by medical men as at once a clear proof of insanity, but the lawyer wants more, he wants (and rightly too, in the editor's opinion) it proved:—1st, that the delusion was connected with the offence and the person upon whom the offence was committed; 2nd, that the delusion was so dominant in the mind of the accused as to annul the distinction between right and wrong; 3rd, that the delusion was so strong as to lead to an irresistible impulse to the act committed. Against such proofs the medical mind at the present day is still fighting with a stupid philanthropy which does more credit to its kindness of heart than to its regard for the real welfare of society. It was the (assumed ?) delusions in McNaghten's mind that led to the *dicta* propounded at the commencement of this discussion. The case of Dodwell, the man who, in 1878, was tried for shooting at the Master of the Rolls (*Reg.* v. *Dodwell*, C. C. C., 1878), shows the results to which this sickly sentimentality on the part of the public and the medical profession may lead, for in 1882 the creature Dodwell made a murderous attack, with a stone in a handkerchief, on the chief medical man of Broadmoor. Was it worth while to try to save such a life?

3. **The Surroundings of the Crime Itself.**—It must be admitted that there are exceptions to almost every one of the following points, but judged as a whole they form, in cases of doubt, the strongest evidence it is possible to get of insanity.

(*a*) *Accomplices.*—The lack of the power of combination is perhaps of all others the most striking characteristic of lunatics, hence it is a practically universal rule that when a lunatic commits a crime he does it without confiding in anybody; obviously the same may be true of a sane criminal, so that the point standing alone is of little weight, it must be taken with others.

(*b*) *The Motive.*—The crime of a lunatic is frequently without motive, or rather it is in opposition to anything that could be called a

sane motive. A man, known to have been tenderly attached to his wife and children, murders them; a fond mother destroys her infant. It is hereby assumed or implied that persons who are sane never commit a crime without an apparent motive, and that in the perpetration of a criminal act, an insane person either never has a motive, or has one of a delusive nature only. If these propositions were true, it would be easy to distinguish a sane from an insane criminal; but the application of the rule wholly fails in practice. In the first place, the non-discovery is here taken as a proof of the non-existence of a motive; while it is undoubted that motives may exist for many atrocious criminal acts without our being able to discover them—a fact proved by the numerous recorded confessions of criminals before execution, in cases in which, until these confessions were made, no motive for the perpetration of the crime had appeared to the acutest minds. In the case of Courvoisier, who was convicted of the murder of Lord William Russell in 1840, it was an undue reliance upon this alleged criterion (before the secret proofs of guilt accidentally came out), which led many to believe that this man could not have committed the crime; and the absence of motive was urged by his counsel as the strongest proof of his innocence. It was ingeniously contended "that the most trifling action of human life had its spring from some motive or other." This is undoubtedly true, but it is not always in the power of a man untainted with crime, to detect and unravel the motives which influence criminals in the perpetration of murder. No reasonable motive was ever discovered for the atrocious murders and mutilations perpetrated by Greenacre and Good, yet these persons were very properly made responsible for their crimes. It would be a fatal error to infer insanity from what is termed the inadequacy of motive.

In the inquiry whether a particular man committed the offence, the consideration of motive may be of great weight—of very little, however, when the inquiry is, whether the man who did it is insane. On the trial of Francis for shooting at the Queen, the main ground for the defence was, that the prisoner had no motive for the act, and therefore was irresponsible; but he was convicted. It is difficult to comprehend under what circumstances any motive for such an act as this could exist; and therefore the admission of such a defence would have been like laying down a rule, that evidence of the perpetration of so heinous a crime should in all cases be taken *per se* as a proof of the existence of insanity—in other words, of an irresponsible state of mind. Crimes have been sometimes committed without any apparent motive by sane persons, who were at the time perfectly aware of the criminality of their conduct. No mark of insanity or delusion could be discovered about them, and they had nothing to say in their defence; they have, however, been held responsible. On the other hand, lunatics confined in a lunatic asylum have been known to be influenced by motives in the perpetration of crimes; thus they have often murdered their keepers in revenge for ill-treatment which they have experienced at their hands, as in the case of *R.* v. *Farmer* (York Spring Ass., 1837). The man was acquitted as insane, while the clear motive for the homicide was revenge and ill-feeling. In another instance the act of murder was perpetrated by a lunatic from a motive of jealousy (*Reg.* v. *Goule*, Durham Sum. Ass., 1845). On the whole, the conclusion

with respect to this assumed criterion is, that an absence of motive when there are indications of insanity, is a presumption in favour of the person being insane; but the non-discovery of a motive for a criminal act cannot of itself be taken as a proof of the existence of insanity or homicidal mania in the perpetrator. On the other hand, the fact that there exists such a motive (jealousy or revenge) as would instigate a sane man to an act of murder, is not of itself a proof that the person is sane and responsible.

The acts of the insane generally arise from motives based on delusion. In the state of idiocy an act of homicide has been committed merely as a result of imitation, and in imbecility, from motives of an absurd and unreasonable kind. Sutherland furnishes some of the particulars of the case of a young man, affected with imbecility, upon whom an inquisition was held in 1843. He was a person of childish manners, and among the symptoms of imbecility there showed itself a strong propensity for watching windmills. He particularly wished to be tied to one of the arms of the mill when they were going round: he would go any distance to see a windmill, and would sit watching one for days together. His friends removed him to a place where there were no mills, in the hope that this strange propensity would wear away. He collected a number of lucifer-matches and set fire to the house where Sutherland attended him, with a view that he might escape during the confusion to some imaginary land of windmills; and on another occasion he enticed a child into a wood, and, in attempting to murder it, cut and mangled its limbs with a knife in a horrible manner. How would any sane person have connected this propensity for windmills with the attempts at arson and murder? Yet it turned out that he had taken the resolution to commit these crimes in the hope that he should be removed to some place where there would be a mill; and in such a place he was confined. He had employed definite means to secure a definite result; and he did attain his end. In *R.* v. *Prince* the motive seems to have been simply that of revenge for fancied neglect, a motive very powerful with reckless sane people, and yet the prisoner was declared to be insane. For the following analysis of this gross miscarriage of justice, the editor is indebted to Mr. Stanley B. Atkinson.

R. v. *R. A. Prince.*—References, 1897, *Times*, 17th December (p. 11), *re* Murder; *Times*, 21st December (p. 7), *re* Inquest; 1898, *Times*, 14th January (p. 5), *re* Trial.

Inquest on William "Torriss" Lowin, before Mr. John Troutbeck, 20th December, 1897, verdict, wilful murder by the man Prince. [Punctured right ventricle, cause of death.] Mental condition of assailant not for coroner's jury to consider.

Trial.—*R.* v. *Prince*, C. C. C., January 13th, 1898, before Channell, J.

(1) Three members of his family mentally weak.

(2) Prince had been "mentally deranged from infancy, in manhood diseased vanity and intense vindictiveness, combined with the grossest delusions to produce a character capable of the worst excesses" (*Times* leader).

(3) At first he pleaded "guilty—with greatest provocation."

(4) Verdict: "We find the prisoner guilty of wilful murder. We say that he know what he was doing, and to whom he was doing it, but, on the medical evidence, that he was not responsible for his actions."

(5) Sentence: "Detained as a criminal lunatic at Holloway until Her Majesty's pleasure be known."—Broadmoor Asylum.

Medical witnesses :—

1. Fitch, M. B. (Salisbury Asylum), proved a relation of Prince's had died under his care eight years previously.

2. Dr. Bastian, F.R.S., had examined Prince (twice), for Home Office. "Unsound mind"—"so for some time." "Mind saturated with delusions of persecution." "Distress and anxiety accentuate condition." "Incapable of exercising self-control at the time." "Insane persons do premeditate." "I think his power was interfered with by these delusions, which influenced his mind to a considerable extent, and that at the time he would not have adequate control over his actions, and would not understand the quality of the act. . . . Where a man has a weak brain power, he has a weak power of control."

3. Dr. T. B. Hyslop agreeing with 2. Delusions of persecution (poison)—smells. Regarded himself as infallible and carrying out the will of God. Without any regret for his act.

4. Dr. Scott, of Holloway Goal.—He only knew the difference between right and wrong to a limited extent.

There is this to be said about motive, that the criminal lunatic practically never murders with the idea of acquisition of property, he almost invariably has a motive of a simple personal character, revenge or a wish to slay (Nicolson, *loc. cit.*). In old men lasciviousness certainly suggests insanity. (Clifford Allbutt, *loc. cit.*)

The following case is copied from the *B. M. J.*, 1, 1904, p. 406.

On February 4th, Mr. Justice Ridley, sitting at the Oxford Assizes, heard the case of *R.* v. *Bond*, in which the plea of insanity was raised in somewhat unusual circumstances.

Mr. T. Mordaunt Snagge appeared for the prosecution ; Mr. Cecil Walsh for the defence.

According to the case for the prosecution, the defendant, who was sixty-three years of age, was charged with having committed indecent assaults upon a number of little girls. Only two charges, however, were proved against the prisoner, and the facts alleged were substantially admitted.

In the course of his address to the jury Mr. Walsh stated that the prisoner's father had suffered misfortune, with the result that Mr. Bond had a considerable struggle to educate himself. He obtained a high degree at Dublin University. He then took orders and became a master at various schools, and finally was appointed mathematical master at an important public school. Eventually he was appointed chaplain of a county lunatic asylum, a position which he occupied until he retired voluntarily after twenty-seven years' service. After this he accepted a small living, and about this time symptoms of mental affliction, which led him to commit acts of the nature complained of, began to manifest themselves. A charge having been brought against him of an act of indecency with a little girl, it was dismissed by the magistrate ; but the accused resigned his living, and went to live near Oxford with his wife, who was seventy-two years of age and very infirm. The evidence of experts would be called to prove that the prisoner was unable to exercise any will at all when these attacks came upon him, that he had no moral judgment in the matter, and that he was the victim of incurable mental disease.

Dr. Theophilus Berkeley Hyslop, senior physician at the Bethlem Royal Hospital, London, etc., called on behalf of the defence, said that he had visited and examined the accused on February 2nd. In his view the accused was suffering from senile brain decay, with incompetency to manage himself. He was suffering from vascular degeneration of the body and brain, as evidenced by the actual state of the arteries, attacks of giddiness with temporary confusion and loss of memory, and numbness of his limbs which had progressed during the last eighteen months. In his (the witness's) view the accused was undergoing progressive deterioration. When questioned as to the acts complained of, he was not able to verify or deny them. His will power was defective, and he suffered from constantly recurring ideas of a perverse sexual character which were imperative and uncontrollable. He was aware of the immorality and illegality of the acts attributed to him. He (the witness) doubted whether the law could relieve him from his misery or clear his mind of the

abherrent ideas which kept recurring. The accused was in such a state that he required medical supervision and treatment. He would grant a lunacy certificate in such a case.

Charles Mercier gave evidence to the like effect, and stated that he would probably have granted a lunacy certificate in the circumstances.

In submitting that the above evidence was sufficient to show that the defendant was not responsible for his actions, Mr. Walsh contended that the opinions of the judges in McNaghten's case were not to be taken as constituting a binding rule applicable to every case, and that the advance of medical science, together with the more recent dicta of criminal lawyers, had modified what was formerly regarded as the strict rule of the law on the subject. Mr. Justice Stephen was quoted as having laid down in his "General View of the Criminal Law," that "no act is a crime if the person who does it is at the time when it is done prevented, either by defective mental power or by any disease affecting his mind (*a*) from knowing the nature and quality of his act, (*b*) from knowing that either that act is illegal or that it is morally wrong, or (*c*) from controlling his own conduct, unless the absence of the power of control has been produced by his own default."

Mr. Justice Ridley, however, ruled that the real question was whether the state of the prisoner's mind was such that he was unable to distinguish right from wrong.

In the course of his summing-up Mr. Justice Ridley said, "The question you have to answer is whether prisoner was responsible for his actions at the time he committed those actions. I wish to speak with great respect for the doctors called, but it is your duty to follow such evidence with a critical mind and judge it. The question is whether the prisoner knew the offence was wrong at the time it was committed. If he did not know it was wrong he is entitled to a verdict which will consign him to a lunatic asylum. I entirely repudiate the idea that mere decay of the faculties is evidence of insanity, or that a person suffering from senile decay is not responsible for his actions. I ask you to exercise your common sense as men of the world."

The jury, after a short deliberation, found the prisoner guilty, and the learned judge passed a sentence of six months' imprisonment with hard labour.

(*c*) *Who is (or are) the victim (or victims), and the number of them.*—The victims of the criminal are those who oppose his desires or his wishes—the victims of the maniac are among those who are either indifferent to, or who are the most dear to him.

Nicolson (Allbutt's System, *loc. cit.*) gives a table of the degree of relationship of persons killed by lunatics, and in another table contrasts the people killed by sane *v.* insane criminals. The most striking point brought out is the frequency with which lunatics murder their own children; amongst women there were only fourteen cases out of a total of 130 where the person killed was other than their own child, and in men out of totals of 200 sane and insane respectively, there were seven only in the former 200 who had killed their children, as opposed to 43 insane who had done so.

The point must, on the other hand, be taken in conjunction with "motive" (*vide* above), where attendants, etc., are murdered.

In the acts of sane criminals one person, or at the most two, may be destroyed; but, in cases of homicidal mania, it is not unusual to find a wife and several children killed by the husband, or four or five children at once destroyed by the wife. A repetition of these atrocities is as common among those who are really insane, as it is unusual among the sane. No motive but that which is based on some insane delusion could be suggested for such a series of murders. Thus, several infants may be found murdered by a mother, who admits the act, but endeavours to account for it by asserting that she wished to convert them into angels, or to save them from destitution or exposure to worldly temptations.

The following is a very common type:—

At the Central Criminal Court, in May, 1904, before Mr. Justice Channell (*Rex* v. *Folkard*). Prisoner had resided at 214, Queen's Road, Upton Park. Shortly before eight o'clock on the morning of April 24th he got up, leaving his wife in bed, and, taking with him his son Joseph, went out of the room, saying it was his intention to go and get breakfast ready. He sent out his cousin, Mary Saunders, who also lived in the house, for a Scidlitz powder. As soon as she was gone he took the baby on to the landing adjoining an attic, cut its throat, and laid it on the floor. He then went into the attic, where his two other children, Willie, aged nine, and Grace Florence, aged seven, were sleeping. He told Willie to go downstairs, and as soon as he had gone cut Grace's throat. He then made an attempt to cut his own throat, and also wounded himself in the thigh. He was found lying on the floor near the bed. It was urged for the defence that the prisoner, who had been suffering from melancholia, was insane at the time he committed the crimes, and therefore not responsible for his acts—a view which was supported by the evidence of Dr. Scott, medical officer of Brixton Prison. The jury found a verdict accordingly, and prisoner was ordered to be detained during His Majesty's pleasure.

(*d*) *The Subsequent Conduct of the Person.*—He seeks no *escape*, delivers himself up to justice, and acknowledges the crime laid to his charge. This is commonly characteristic of homicidal mania; for by the sane criminal every attempt is generally made to conceal all traces of the crime, and he denies it to the last. A case occurred in 1843 which shows, however, the fallacy of this criterion. A man named Dadd murdered his father at Cobham, under circumstances strongly indicative of homicidal mania. He fled to France after the perpetration of the crime, and was subsequently tried, and acquitted on the ground of insanity. On the other hand, it must be remembered that sane persons who destroy the lives of others through revenge or anger, often perpetrate murder openly, and do not attempt to deny or conceal the crime, for the simple reason that denial or attempt at concealment would be hopeless. Again, a morbid love of notoriety will often induce the sane criminal to attempt assassination under circumstances where the attempt must necessarily be witnessed by hundreds, and there can be no possibility of escape. The attacks made some years since upon the life of the Queen are sufficient to bear out this statement.

Summary, Cases, and General Considerations.

Summary.—These considerations lead to the inference that there are *no certain legal or medical tests* whereby lunacy can be demonstrated to exist. Each case must be determined by the circumstances

attending it: but the true test for irresponsibility in all doubtful cases appears to be, whether the person at the time of the commission of the crime, had or had not a *sufficient power of control to govern his actions;* or, in other words, whether, knowing the act to be wrong, he could not avoid the perpetration of it. This involves the consideration, not only whether insanity existed in the accused, but whether it had reached a degree to destroy, not a consciousness of the act, but volition—the will to do or not to do it. If from circumstances it can be inferred that an accused person had this power, whether his case can be decided by the above suggestions or not, he should be made responsible and rendered liable to punishment. If, however, he was led to the perpetration of the act by an *insane* impulse, or, in other words, by an impulse which his mental condition did not allow him to control (lésion de volonté, Esquirol), he is entitled to an acquittal as an irresponsible agent. The power of controlling an act appears to imply the existence of such a state of sanity as to render the person legally responsible: and when there is this want of control, it may be fairly concluded that the person is irresponsible at law. Want of self-control is one of the most marked features of insanity. According to Radcliffe, it is a symptom in all cases, and what is important in reference to responsibility, is that in the order of development it takes precedence of delusion. Along with the want of self-control, there is also very frequently a want of voluntary power generally. The lunatic as a rule is led by his feelings and thoughts, and is strangely incapable of exercising his will effectually. Sometimes, in certain directions at least, his will appears to be powerless (*Lancet*, 1873, 1, p. 472). Admitting that there may be some difficulty in applying such a test, it may be observed that one somewhat similar to this is constantly applied by juries, under the direction of our judges, to distinguish murder from manslaughter; and it is quite certain that sanity and homicidal mania are not more nicely blended than those shades of guilt whereby manslaughter passes into murder. The manner and circumstances under which a crime is committed will often allow a fair inference to be drawn as to how far a power of self-control existed or was exercised. A man in a fit of mania or delirium rushes with a drawn sword into an open street, and stabs the first person whom he meets; another, worn out by poverty and destitution, destroys his wife and children to prevent them from starving, and then probably attempts to murder himself:—these are cases in which there is a fair ground to entertain a plea of irresponsibility. But when we find a man like McNaghten, who shot Mr. Drummond by mistake for another person, lurking for many days together in a particular locality, having about him a loaded weapon; watching a particular person who frequents that locality; not facing the individual and shooting him, but coolly waiting until he had an opportunity of discharging the weapon unobserved by his victim or others—the circumstances appear to show such a perfect adaptation of means to ends, and such a power of controlling actions, that one is quite at a loss to understand why a plea of irresponsibility should have been received in such a case. The acquittal was the more remarkable because there was no proof of general insanity, and the crime was committed for a supposed injury. According to the rules laid down by fourteen of the fifteen judges,

from questions submitted to them in connection with this case, this man should certainly have been convicted.

In former days the verdict seems to have been very capricious and accidental in its leanings; witness the two following cases:—

The case of *Reg.* v. *Brixey* was tried at the Central Criminal Court in June, 1845. The prisoner, a quiet inoffensive girl, a maidservant in a respectable family, was charged with the murder of an infant. She had laboured under disordered menstruation, and, a short time before the occurrence, had shown some violence of temper about trivial domestic matters. This was all the evidence of her alleged (intellectual) insanity—if we except that which was furnished by the *act* of murder. She procured a knife from the kitchen on some slight pretence, and while the nurse was out of the room cut the throat of her master's infant child; she then went downstairs and told her master what she had done. She was perfectly *conscious* of the act she had committed; she treated it as a crime, and showed much anxiety to know whether she should be hanged or transported. There was not the slightest evidence that at the time of the act, or at any time previously, she had laboured under any delusion or intellectual aberration. The prisoner was acquitted on the ground of insanity, probably arising from obstructed menstruation (*Med. Gaz.*, vol. 36, pp. 166, 247.

The existence of legal insanity in this case was an inference based solely on the *act* committed, and on the *mode* in which it was committed. In his defence of Brixey, Mr. Clarkson uttered a plain medical and legal truth, in stating that "*no general rules can be applied to cases of this sort:* each case must be decided by the peculiar facts which accompany it." Notwithstanding the precedent to the contrary furnished by this and other cases of a similar kind (*Reg.* v. *Snoswell*, *Med. Gaz.*, vol. 47, p. 569), a court of law will commonly look for some clear and distinct proof of mental delusion or *intellectual* aberration existing previously to or at the time of the perpetration of the crime. If there be no proof of delusion, or of failure of intellect on the part of the accused, the plea of impulsive homicidal insanity may still be rejected.

In *Reg.* v. *Burton* (Huntingdon Sum. Ass., 1848), the prisoner was indicted for the murder of his wife by cutting her throat. It appeared that he had no motive for killing her—that he had been previously unwell, and restless at night—that he did not attempt to conceal or deny the commission of the crime, and that he expressed no sorrow or remorse for it when perpetrated. The medical witness attributed the act to a sudden homicidal impulse; the prisoner's reason was not affected, and he had not laboured under delusions. The judge dissented from the medical opinion, because the excuse of an irresistible impulse co-existing with the full possession of reason would justify any crime whatever. The facts rendered it probable that there was not a *full* possession of reason in this case; there was some evidence of bodily disease which may have affected the brain, as in the case quoted by Stephen, J. (*ante*, p. 872). No rational being would commit an act of this kind under the circumstances mentioned. As in other cases, there may have been delusions springing up in the mind suddenly, and not revealed by the previous conduct or conversation of the accused. There appears to have been no stronger reason for convicting this prisoner than for convicting Brixey. He was nevertheless found guilty, while Brixey was acquitted.

At the Northampton Assizes, November, 1897, James Shaw, twenty-five, was indicted for the murder of a little boy by cutting off his head with a razor. The sister of the victim, æt. 10 (*vide* p. 196), gave evidence that the prisoner had "insulted her," and then gone off with her brother, who was found with his head cut off. It was proved that the prisoner had had "fits" as a boy, but not since.

Dr. Stevenson, lecturer at Guy's Hospital, and scientific analyst to the Home Office, deposed to receiving from Superintendent Norman the blue serge suit produced. He saw stains upon the jacket, a good deal from the left breast to the hip pocket, on the right breast, near the right cuff, more on the left sleeve between the

elbows and the wrist in front, and inside each cuff. They were stiffened blood stains. There were no stains on the waistcoat, but there were on the trousers betwixt the fork and the knee on the right leg. There was no evidence of any attempt to take the stains away, and witness made an analysis of them. They were stains of mammalian blood; that was to say, human blood or that of some animal which suckled its young. It was fairly recent, probably not more than ten days old when he saw it on July 15th. He could not tell the difference by analysis between human blood and some mammals', except when he got the blood quite recent, and then it was a matter of strong inference, and not positive determination.

Assuming that you had these facts proved [and they were proved in evidence—Ed.]: the case of a man whose father had three times attempted to commit suicide; a man who himself as a child had had fits; that when he was fifteen years of age some affection of the brain from which he was more or less unconscious for three weeks,—in what direction would those facts point?—They would point to a man being possibly or probably insane.

Assuming it was also proved to your satisfaction that the prisoner's, the alleged criminal, conduct two years before the alleged crime was this: Calling out of the window for an imaginary cab, and on getting no answer putting his fist through the glass of the window. On being checked from doing this, threatening to cut the throat of the person who checked him. Assuming also that it has been proved to you that prisoner had been in the habit of beating the pillow of his bed with the poker and threatening somebody he believed to be in the pillow, when no such person existed at all. When sitting quietly cleaning his soldier's clothes, suddenly getting up and throwing things at what he thought was on the wall. Being found by himself in a room with a bag of shavings suspended in some way from the roof and punching it till the sweat was streaming off him. Assuming that at times the prisoner never spoke a word for long periods together, and being dull and despondent, if you were satisfied of the truth of these facts, in what direction would they point as regards his criminal responsibility?—They would point to his suffering from delusions either from drink or insanity.

Put the matter of drink entirely out of the question?—It would point to delusions. I should not take much notice of punching a bag of shavings; anybody who practised for boxing might do that.

Would the other things point to his being an insane man?—They would point in that direction, and he ought to be examined by one skilled in examining the insane.

If you find some person talking and muttering to himself, and complaining of feeling queer and wanting to kill somebody, what would that point to?—If the man was really expressing his feelings it would point to insanity.

Suppose a case in which all the things I have put to you were proved to be the past history of the deceased, and the crime itself was without motive, and of great ferocity, would not all that point to the fact that a person was not criminally responsible for his actions?—Certainly it would point in that direction.

Is it possible for a man to do all those things mentioned in cross-examination, and yet know right from wrong?—I think a man might do all these things and yet know right from wrong in the ordinary sense of the term.

Mr. Lee F. Cogan, surgeon to the prison and medical officer of the borough, said he had had prisoner under observation. Witness had observed that the man at times was confused and unnatural when spoken to. When spoken to about the matter he was charged with he had seemed to treat it with levity. Witness had seen a report presented by Dr. Bayley, and knew he had the evidence of the soldiers and Mrs. Hobbs before him. Having regard to all that evidence, witness considered prisoner of unsound mind, but could not swear that that unsoundness of mind existed on July 10th. It most probably would have been in existence at the time.—By Mr. Sills: Prisoner seemed to understand the difference between right and wrong, but there were occasions when witness believed he did not. Witness did not think prisoner had delusions.—By Mr. Chambers: The condition popularly called half asleep and half awake would not last while a man was belabouring a pillow.—By the Judge: He believed the state of the prisoner was genuine.

Dr. Bayley, resident physician at St. Andrew's Hospital, said he had made diseases of the mind a special study, and had been thirty-three years at St. Andrew's Hospital, and before that five years Superintendent of Salop County Asylum. He had examined prisoner, and had certain evidence before him. One soldier told witness that prisoner after an outbreak told him he had murderous instincts. On

October 6th prisoner's manner was very strange, and when questioned as to what happened on the day of the crime prisoner laughed, and also laughed at a warder. Witness thought prisoner's manner was genuine. On October 20th he was in much the same condition, and when asked why he laughed on the previous occasion, said, "I know that when you talked to me about my position I laughed. I could not help it. Sometimes a dizzy feeling comes over me, and, although I knew it was wrong to laugh, I could not help it. In barracks I sometimes had these feelings, and sometimes fainted on drill. I do not remember the things the other soldiers say occurred in barracks." Witness believed prisoner to be insane. He should say his mind had been affected for some time.

By Mr. Chambers: Do you think on July 10th prisoner would have been in such a condition as to do a cruel act without knowing it was wrong?—I think he was suffering from homicidal mania, and a person suffering from that disease might be apparently sane at the time he committed a crime under an impulse he was unable to control.

Would that be an impulse he would be unable to control if a policeman were standing by?—Certainly.

By Mr. Sills: Do you think that seeking to cover the body with grass consistent with homicidal mania?—I do.

Have you any reason to think that on July 12th this man had homicidal mania?—I believe he had, and I have formed this opinion from my knowledge of similar cases.

Would a strong motive for killing this boy make any difference in your opinion as to homicidal mania?—No. I think homicidal mania may have an object to work for.

Suppose he tried to conceal the crime, would that make any difference?—No.

Under any circumstances you then think that prisoner had homicidal mania?—I believe so.

Is that opinion founded upon the supposition that prisoner early in life had fits?—Partly.

By Mr. Chambers: Assuming that all the facts were accurate, except that as regarded the fits, would your opinion be altered?—Not at all.

His lordship, in summing up the case to the jury, reviewed the evidence against the prisoner, and called their attention to the marks of blood upon the clothes of the prisoner and the discovery of the razor as being relied upon by the prosecution to prove that he committed the crime. As to the question of motive, that was, he said, a point for them also to weigh, and to consider whether they accepted or not as a serious part of the case upon which to convict the prisoner. It certainly might tend to show a reason for the commission of the crime, but otherwise it was immaterial whether it happened or not, as the murder was committed. Referring to the question of insanity, his lordship said a man did not get rid of his responsibility for a murder or any other criminal act on that ground unless he was in such a state or defect of understanding brought about by a mental disease that at the time he committed the act he was incapable of distinguishing whether what he was doing was right or wrong. The jury would have to say whether, if they thought the prisoner was guilty of the crime, he was in such a state of mind as to know right from wrong when he did it. His lordship dealt with the evidence brought forward on that point by the defence, and certainly thought it was worthy of their consideration. Concluding, he asked the jury to say whether they found the prisoner guilty of the murder, and if they did so find him guilty, then whether or not they thought that at the time he committed it he was insane, so that according to law he was not responsible for his actions.

It appears that such crimes as these cannot be fairly regarded as the act of *sane* and responsible persons; and even those who deny the independent existence of such a form of insanity as *homicidal mania*, are in general compelled to admit that these motiveless murders are really the acts of insane and irresponsible agents. In reference to the case of Brixey, if this woman was not labouring under homicidal mania, or an uncontrollable impulse to murder, it is clear from the result that her mental condition at the time of perpetrating the murder was such as to justify her acquittal on the ground of

insanity; and medical jurists do not ask for more than this, although the means by which they seek to obtain acquittals in such cases may appear objectionable and unsuited to legal dicta. To assert that there was an unconsciousness of the nature or criminality of the act in this case would be conflicting with all the facts proved; and to contend that the consciousness of right and wrong, if it existed, was itself of an insane kind, would be a mere *ex-post-facto* assumption. The occasional existence of a state of homicidal mania, wholly irrespective of proved intellectual insanity, appears to be established by this case, for there was not the slightest evidence of previous *intellectual* aberration, or of insane conduct. The motiveless character of the act perpetrated, and the mode of perpetrating it, were the only indications.

Either some persons are improperly acquitted on the plea of insanity, or others are unjustly executed. If the punishment of death were abolished, there is no doubt that less would be heard of this plea; but in the meantime it is unfortunate that there is no other way of avoiding capital punishment than by striving to make it appear that a criminal is insane (See Prichard, p. 399). It is on this point that medical witnesses seem to lose sight of their true position—they too frequently look to results. When the punishment attached to an offence is not capital, it would appear that much stronger evidence is required to establish a plea of insanity than under other circumstances.

In the case of Bryce (High Court of Just., Edinb., May, 1864), the defence of insanity was rejected by the jury. The medical grounds on which it rested, were that the prisoner was a person of low mental organisation, and that at the time of the murder he acted under a delusion that the person whom he murdered had called him a "drunken blackguard." But in answer to this it was stated that it was precisely persons of low mental organisation who committed murder, and who required to be restrained by the fear of punishment; and as to the second point, the medical witnesses admitted that if it were true the deceased had called the prisoner a "drunken blackguard," there would be no delusion in the matter (*Edin. Month. Jour.*, July, 1864, p. 76).

Some doubt has existed whether a medical witness, on a trial in which a plea of insanity is raised, could be asked his opinion, from the evidence respecting the state of a prisoner's mind at the time of the commission of the alleged crime, whether the accused was conscious at the time of doing the act, that he was doing something contrary to law, or whether he was then labouring under any and what delusion. It has been decided that facts tending to lead to a strong suspicion of insanity must be proved and admitted before the opinion of a medical witness can be received on these points (see *Med. Gaz.*, vol. 46, p. 240).

In giving an opinion of the mental condition of an accused person, it is no part of the province of a witness to modify that opinion according to the *punishment* which may follow if the plea be rejected, but simply according to the medical *facts* of the case. The legislature only is responsible for the punishment adjudged to crimes. Mayo observed that a medical witness is summoned to a court of justice in order to enable the judge and jury to arrive at certain practical conclusions. The question proposed to him involves a simple fact, and not its consequences; and if the latter consideration be entertained by

him, it will be liable to bias his evidence on the fact, which is his legitimate topic. The definition of insanity becomes very expansive when its expansion may become protective to a criminal with whom we may happen to sympathise. The question whether the accused is a responsible agent is of a judicial nature; our evidence should be confined to the question whether the accused is *insane* in a certain sense or meaning in which it is understood and defined by law ("Med. Test. and Evid. in Cases of Lunacy," 1854, p. 9). If a medical witness in these cases moulds his evidence to a foregone conclusion on the criminal responsibility of the accused, he lays himself open to a remark from the judge that he must not encroach on the functions of the jury. It is an evil that, under the present mode of laying this question before a jury, the law operates unequally. One case becomes a subject of prominent public interest, and every exertion is made to construe the most trivial eccentricities of character into proofs of insanity, and to magnify the effects of an hereditary tendency, owing to some remote relative having been confined as a lunatic; an acquittal follows. Another case may excite no interest—it is left to itself; the accused is convicted, and either executed or otherwise punished, although the evidence of insanity, had it been as carefully sought for and brought out, might have been stronger in this than in the former instance.

Probably no case in modern times produced greater excitement in the public mind, or so strongly directed attention to the defence of insanity in trials for murder, as that of George Victor Townley, who was charged with the murder of a young lady to whom he was engaged to be married (*Reg.* v. *Townley*, Derby Wint. Ass., 1863), *vide supra*, p. 875, for report. In this case there was a clear and distinct motive; there was a full consciousness of the nature of the act and of its penal consequences, as well as an absence of any delusion or of anything indicative of intellectual insanity in the conduct of the prisoner up to within a short time of the act, or in the numerous letters which he wrote. The prisoner had entered into an engagement with Miss Goodwin. Shortly before the murder she had written to him requesting to be released from her engagement; and she candidly told him that she had formed an attachment to another man. In his correspondence with her he requested a last interview, to hear (as he said) her determination from her own lips. The prisoner went to her house on August 21st, 1863, induced her to take a walk with him; and in about an hour she was found bleeding from severe wounds in her throat, from the effects of which she soon died. Townley made no attempt to escape: he admitted that he had stabbed her, and assisted in carrying her dead body.

At the trial there was no answer to the charge of murder, except that the prisoner was insane when he perpetrated the act; that he was maddened partly by the refusal of the deceased to marry him, and partly by the knowledge that she was engaged to and would probably be married to another man. Some evidence was produced to show that the prisoner was impulsive and excitable at times, and had been reserved in his manners; but no one of his relatives had ever treated him or regarded him as insane, and, until this murder was perpetrated, no one had ever suggested that he had done any act or uttered any expression indicative of insanity. There was some evidence of the

existence of insanity in the family of the prisoner's grandmother. The defence was thus chiefly thrown upon the medical evidence. Winslow examined the prisoner three months after the perpetration of the crime, and then considered the case of Townley to be one of "general derangement," and that he had not a sane opinion on any moral point. The prisoner expressed no regret or remorse for what he had done; he denied that he had committed any crime—said the deceased was his property, and that he killed her to recover and repossess himself of property which had been stolen from him. He knew that killing a person was contrary to law and wrong in this sense; and from his saying he should be hanged, he must have known that he had done wrong. Gisborne, surgeon of the gaol, gave similar evidence, and stated that when admitted in August, Townley was in the same condition as when he was examined by Winslow in November.

Taking into consideration all the circumstances of this case, it is impossible to regard the act in any other light than as one of murder through jealousy. Three commissioners in lunacy, in consequence of a recommendation from the judge, were appointed by Secretary Sir G. Grey to see and examine the prisoner and report to him on his *then* mental condition—the inquiry at the trial having been confined to the state of his mind on the day of the murder. They reported as the result of their interview with him, that they could not consider him to be of sound mind, but applying the law as laid down by the judge he was justly convicted. This so far coincided with the view of the learned judge that the conviction was right. Under the 3 & 4 Vict. c. 54, s. 1 (since repealed), a certificate was drawn up by two justices and two medical men to the effect that the prisoner was insane. The capital sentence was respited but not commuted, and under the order of the Secretary of State the prisoner was removed to Bethlem Hospital. As this proceeding was not considered to be satisfactory, a second commission was issued by the Government to make further inquiry into the state of mind of the prisoner. The commissioners were all men of good experience in reference to insanity. After two lengthened interviews with the prisoner, they came to the conclusion that he was of sound mind. The reasons which they assign in their reports are clear and satisfactory, but too long to be quoted in this place. On their judgment the sentence of the prisoner was commuted to penal servitude for life. He was removed to a convict prison, where he subsequently committed suicide.

Tested by the rules respecting criminal responsibility assigned by Stephen, J., the evidence in this case shows clearly intention, will, and malice. There was an absence of proof of delusion, and to affirm that the act arose from an irresistible impulse is a mere assumption, without any fact in the previous or subsequent conduct of Townley to give it support. It may be well inquired of those who adopt the theory of irresponsibility in this case—If this is *insanity*, what is *crime?* If Townley was irresponsible for an act thus coolly perpetrated, in which the motive was so clear, no person should hereafter be convicted of murder who stabbed a woman from jealousy, revenge, or mortified pride. There was no doubt that Townley had a consciousness of right and wrong—that he knew the act was illegal and punishable by the law of the land; but his guilt did not rest upon these judicial tests of

criminal responsibility. He had this knowledge in common with all sane and some really insane persons. In his case, however, insanity was neither proved nor rendered even probable, while it was disproved by his conduct and all the circumstances connected with the act of murder. It may be wrong to convict all men who come up to this judicial standard, *i.e.*, who know right from wrong, because insanity may coexist with such knowledge; but it would be equally wrong to contend that, in the absence of any clear proof of insanity, a man should be acquitted of crime when, under the influence of a strong motive, he was doing an act which he knew to be wrong, and of which he well knew and calculated the legal consequences. One medical defender of Townley, in order to account for the absence of symptoms of insanity, suggested that the duration of the homicidal impulse was short, and did not extend beyond the period of the commission of the act to which it impelled (*mania transitoria*). There would be no difficulty in making out on these principles that every act of murder was the result of impulsive insanity, and that all murderers while stabbing others are morally insane, and therefore, although they may show sanity before and afterwards, they are irresponsible for their acts. The legal test of a consciousness of right or wrong is much complained of, but in practice it cannot be said to err on the side of harshness or severity. But the medical assumption here suggested to extenuate Townley's crime would go far to exculpate every criminal who committed an act of murder.

The doctrine of "irresistible impulse," and the theory of impulsive insanity have been strained to such a degree as to create in the public mind a distrust of medical evidence on these occasions. It is easy to convert this into a plea for the extenuation of all kinds of crimes for which motives are not apparent, and thus medical witnesses expose themselves to rebuke. They are certainly not justified in setting up such a defence, unless they are prepared to draw a clear distinction between impulses which are "unresisted," and those which are irresistible. In the case of *Reg.* v. *Allnutt*, the prisoner, a boy aged twelve, was convicted of poisoning his grandfather, under circumstances indicative of sane contrivance and deliberation. The medical evidence entirely failed to show that the prisoner was or ever had been insane in a legal sense. The remarks made by Rolfe, B., who tried the case, are of importance: "The witnesses called for the defence had described the prisoner as acting from uncontrollable impulse, and they had made other statements, of the value of which it would be for the jury to decide; but he must say that it was his opinion that such evidence ought to be scanned by juries with very great jealousy and suspicion, because it might tend to the justification of every crime that was committed. What was the meaning of not being able to resist an impulse? Every crime was committed under an impulse, and the object of the law was to compel persons to control or resist these impulses. If it was made an excuse for a person who had committed a crime, that he had been goaded to it by some impulse which medical men might choose to say *he* could *not* control, such a doctrine would be fraught with very great danger to society."

It is only too easy to collect a very large number of cases in a very short time. The following startled the public in the spring of 1904.

Rex v. *Rodgers*, Camb. Spr. Ass., 1904, before Mr. Justice Phillimore. Frank Rodgers, æt. 15, was charged with the murder of his mother, who was an habitual drunkard.

Winifred Rodgers, elder sister to the prisoner, related how she, Frank, and a little sister Queenie, had supper together on the evening of the 12th, Mrs. Rodgers being in the room under the influence of drink. After supper witness and Queenie were in the drawing-room when Frank entered with a revolver in his hand, and exclaimed, "I have shot her; I thought it best." A doctor was sent for, but Mrs. Rodgers died instantly. Later that night Frank told witness that he did it for the sake of Queenie, who, he said, could not be brought up to the life they had led for the last few years.

William George Rodgers, a brother, deposed to the ownership of the revolver with which the shot was fired.

In cross-examination, witness said Frank had been strange in his behaviour for about six weeks before the tragedy. He had strange fancies, and one morning at breakfast said he had dreamed that he had strangled his mother.

Dr. Ennion, of Meldreth, said the wound from which Mrs. Rodgers died could not have been self-inflicted. While in attendance on the family he had noticed Frank's extraordinary behaviour. After the tragedy the boy told him he distinctly heard a voice tell him to do it quickly.

For the defence three experts in mental diseases were called.

Dr. Robert Percy Smith, 36, Queen Anne Street, London, formerly superintendent of the Bethlem Hospital, gave his opinion that the boy was of unsound mind when he shot his mother.

Mr. Justice Phillimore: Do you mean there was a warping influence greater than or other than the influence of passion?

Witness: Yes, my lord.

In cross-examination witness said the murder was not merely an act done on the impulse of the moment, but that it was an act which the prisoner had considered beforehand.

Similar evidence was given by Dr. Henry Charles Bastian, of Manchester Square, London, and Dr. Edward Coulton Rogers, medical superintendent at the Cambridge County Asylum. The latter, who examined the boy under the instructions of the Director of Public Prosecution, said: I consider him not to be of sound and right judgment, but find no other definite symptoms of insanity at the present time from my conversation with him. Giving all weight to the circumstances within my knowledge, I have formed the opinion that at the time of the commission of the act he was in a state of morbid mental exaltation, during which he made some effort to resist, and at last suddenly yielded to a recurrent impulse to commit a crime for which an immature judgment had for some time led him to believe there was moral justification.

Evidence of insanity on the mother's side was given by Robert Robson, of Harcourt Street, Marylebone, brother of the deceased.

William Alexander Rodgers, the husband of the deceased, said he took the house in the country because of home troubles. He thought his wife would be away from the means of getting drunk. Great affection had existed between Frank and his mother.

The jury found the prisoner guilty, but that he was insane at the time of the murder.

His lordship ordered the boy to be detained during his Majesty's pleasure.

The following is a common type:—

In May, 1904, the colliery village of Mosborough, six miles from Sheffield, was the scene of a fearful tragedy. Joseph Henry Bowman cut the throats of his two young children and his wife, and afterwards took his own life in the same way. About five the neighbours saw Mrs. Bowman rush into the street in her nightdress, covered with blood, and screaming, "Oh, my children." The house was entered, and it was found necessary to break open the door of the bedroom. Inside the two children, one aged three years and one four months, were found in a dying state with their throats cut and their faces terribly gashed. The man was lying on the floor with his throat cut from ear to ear. He was removed to Sheffield Hospital, and died very shortly after. The children died in a few minutes after being

discovered. The husband and wife lived on the happiest terms, but, nevertheless, the crime seems to have been of the most deliberate character, and just before he died Bowman confessed to having got into debt and declared he did not want to leave anything behind him.

Had the man survived he would no doubt have been found insane.

At the Central Criminal Court, February, 1903 (*R.* v. *Edwards*), Edgar Edwards was charged with the wilful murder of John Darby. The prisoner was proved to have obtained a heavy sash-weight (weighing five and a half pounds) just previous to the murder. With this weight the prisoner seems to have murdered the man Darby and his wife, and then to have strangled their little child; the bodies of the parents were then cut up and removed in sacks and buried in a garden at Leyton. Owing to an unprovoked attack upon another man suspicions of the original murder were aroused and the bodies were then found. A defence on the ground of insanity was raised, and the following evidence was given.

As regards the actual murder, Dr. Lewis Nugent Jekyll said: I was called to 89, Church Road, where I saw six sacks containing the dismembered bodies of a man and woman; the heads and limbs had been cut off. I also saw the body of a child, which was intact. The heads were quite recognisable. The cause of death was due to injury to the heads in the cases of the man and woman, and in the case of the child to strangulation; there was a handkerchief tied tightly round its neck—there were extensive fractures to the skulls of the man and woman—there had been three or four blows delivered—the face of the woman had been smashed in, and there had also been a blow on the back of each of their heads—the serious blows had been struck from the front—the blows on the back of the heads were not of a serious nature, they might have been done in falling—the bodies had been dismembered by means of a saw. I should say that in each of the two cases the cause of death was from a blow which had been delivered from the front—I cannot say if it was the first blow or not—the blows were undoubtedly tremendous and ferocious.

Dr. Luff gave evidence respecting the scene of the murder.

Arthur Pearson Luff: I am lecturer at St. Mary's Hospital. On January 4th, with Inspector McCarthy, I visited 22, Wyndham Road, and examined some stains there on the floor, walls, and window upstairs; on the right of the fireplace in the front room, upstairs, there were several blood-stains which had been projected from a living artery or arteries, and facing towards the fireplace, they had been projected from left to right; they were entirely on the right side of the fireplace, and there were also several underneath the mantelshelf, but none on the top of it—having regard to the stains on the mantelshelf, the person was probably sitting on the left side of the fireplace, facing the window—there were several blood-stains at two different levels on the wall between the fireplace and the window, which also had all been projected from an artery or arteries during life—those on the lower level were simply a continuation of the spurts or stains on the fireplace, those on the higher level must have been caused while the person was standing up—on the window sash, and on the lower part of the window blind, there were blood-stains, and there were a few blood-stains on one of the lowest panes of the window, and

the lowest part of the blind—there were two very large stains on the floor, one in front of the fireplace, and the other in front of the left window—outside the door at the head of the staircase there is a small landing with three doors opening from it—on the outer side of the door of the front room there were several blood-stains which had been projected from arteries or an artery, during life—on the outer side of the door of the bedroom facing the front door, there were also some blood-stains, which had been projected from an artery or arteries during life, and which had been slightly washed—the stains on the front-room door came on it when it was closed or partly closed, but in all probability closed—on the floor of the back bedroom there were two large stains, more or less covered over by means of ink—I removed some of the panels of the doors of both rooms and a pane of glass—I examined them by the chemical and microscopical tests; they all contained evidence of having on them mammalian blood, which had been shed from four to six or eight weeks—the first article was examined on January 5th, and the last on January 19th—I saw two sash-weights—No. 5 was the one which was used—I was informed that it was brought from 22, Wyndham Road—on the hanging end, I found a quantity of a dark red stain which I found to consist of mammalian blood, which on January 5th was from four to six weeks old, and sticking to it by one end was a single hair which I have now with me—I requested the police to bring me samples of the hair from the heads of William John and Beatrice Darby—I compared those with the single hair on the sash-weight, and found that it was exactly similar to the hair of William John Darby—on January 6th, I received this saw (*produced*) from Detective Sergeant Milton; it was found at Wyndham Road—I examined it on the 9th, and found a few stains of mammalian blood upon it—I received a scarf which I was informed was found in the back bedroom at Wyndham Road, and a shoe which was found in a cupboard in the front room—the scarf was simply saturated with mammalian blood, from five to seven weeks old, and on the inner side of the heel of the shoe there was one blood-stain, also from five to seven weeks old—on January 4th, I went to Carter Street Police Station, and was shown a bookcase or wardrobe, on the right edge of which and about fifteen inches from the top I saw some hair sticking in a dark clot—I removed it, the clot consisted of mammalian blood four to six weeks old, and the hair was identical with William John Darby's—I also saw the top of a round table that had some stains on it—I had two pieces of the table sawn away; the stains were blood-stains—on January 4th, a hair net was given to me by the police at 22, Wyndham Road, in the front room—there was some hair and a comb with it; I compared them with samples given me, and it was similar to that of Beatrice Darby's.

As regards evidence of insanity Dr. Luff said: I should imagine that the attack on these unfortunate people was a very ferocious one—we group the predisposing causes of insanity into mental and moral ones—heredity and stress may be predisposing causes, but I do not think you can bring them all into two groups—there are very many types of insanity—if on the maternal side of a family you can trace insanity for some time past, that might be a predisposing cause to insanity in an individual, but I should

require to know the extent of it if I was reporting to an asylum—if it began with the prisoner's grandfather's sister, and was traced to the brother of the prisoner's mother, and then to two or three of the prisoner's nieces, that would be a close connection of insanity in the family—if I had to report on a case like that, I should report that those were possibly predisposing causes—if it was undoubted insanity, and radiated to nieces and sisters in a collateral way, it would be stronger than missing a generation—if there is a depression at the back of the prisoner's head which was the result of an accident some years ago, it might come under the head of stress, but I cannot say without examining it—if there was a depressed fracture of the skull, that might be so; assuming that to be so, the thickening of the bone might lead to atrophy of brain—pressure of the brain might possibly lead to insanity, which you might discover by symptoms, or the X rays—I do not think you could discover it by touch or feeling—insanity sometimes skips a generation—I know the facts of this case; from my experience, I should not say that many of the acts in it are those of a person of unsound mind—I do not know that I should consider the weapon with which the murder was committed is a very extraordinary one—it is a very effective one—I should think a weapon of this kind is a very easy thing to obtain, as they are to be found in every house—I cannot say that I have ever heard of a sash-weight having been used before for such a crime—looking at the case from an ordinary point of view, one would say that to commit these wholesale murders would be scarcely worth the while—I should not say that the doing of it is an indication of insanity—I have been connected with similar cases, where over-anxiety about detection has not been noticed in persons who were described as sane, and who were never found to be to the contrary; in those cases insanity was set up as a defence, but two of them were not successful—a sane person is not always over-anxious; it depends on temperament; many people are callous without being insane—I do not think it is an indication of insanity to commit wholesale murder; there is no reason why a man who does so should not be insane, but I should like to know the facts of the case before I decided—it is decidedly exceptional to meet with a case of wholesale murder—I can recollect a case in which there were two murders committed, but never three in my personal experience—it is very common in cases of insanity, for an insane person to be controlled and influenced by the same motives which actuate persons who are sane, but 99 per cent. of the cases of insanity are not insane altogether, they have got many sane sides—violent impulses to acts of murder or homicidal attacks may be dormant in an individual for a long time without showing outside expression—a person may not show to the outside world evidence of the conflict going on inside his mind, and there may not be any such conflict—those people may have uncontrollable destructive impulses, but whether the person knows the difference between right and wrong at the time is the debatable point—there are some eminent medical men who hold that insane persons may commit an act knowing it to be wrong, but are unable to control the impulse to commit it—there are some cases in which the act itself is the chief evidence of mental disorder in the individual—in the majority of cases of homicidal mania, the person

who commits the act does not seek to obliterate all traces of the crime; they are quite indifferent to the traces—my experience of criminals is that indifference as to concealing the act is a characteristic of insanity—I should say that in the majority of undoubted cases of insanity persons are indifferent as to obliterating traces of the crime when acts of this sort are committed—persons do not always show great calmness, but they do show absence of fear; they sometimes show great cunning and ingenuity, but at the same time they may be quite indifferent in effecting concealment and indifferent to the number of lives they take—I do not say that that is evidence of insanity, but it is a frequent consequence; it is more likely to be associated with an unsound mind than with a sound one—I should say it is probably the case that an insane person committing a murder would not have accomplices, however colossal the scheme may be—an insane person suffering from a homicidal paroxysm might kill any number of persons, but so might a sane person—I do not say he would do so without a motive—I cannot say what is sufficient motive—a sane person committing an act which might forfeit his life, might not have a sufficient motive—I have known a few pounds be sufficient motive, and where there was no evidence of insanity; both the cases I was thinking of were murders done in trains, I believe both on the Brighton line: the murderer might not know the amount of money the victim had, but a person probably would not be carrying much money—I believe one was in a first class carriage.

Re-examined.—Homicidal uncontrollable impulses are generally sudden—a person who is subject to them would not lay his plans some time beforehand—the plans would of course be just as suddenly arranged as the act—I have not examined the prisoner nor his family history.

The actual assault on an indifferent person is thus described by the victim:

I was at the prisoner's house at Leyton to discuss some business matters with him—I was with him several hours—he paced about a great deal and apologised for keeping me waiting—there was nothing in his manner to cause me to fear him in the slightest—his attack was absolutely unprovoked, and took place in a moment—he gave me a very severe blow, it almost knocked the senses out of me, and it was followed by a number of blows rained upon me while I was on the ground—in another moment he might have killed me—towards the end of the attack he tried to force a handkerchief or cloth into my mouth—he was almost exhausted by the force of his own blows—he began to show signs of fatigue—I had a hat on at first—I cannot say when I lost it—I was taken away from the house—I think the prisoner might have attacked me at any other time while I was in the house—we were on perfectly good terms—I found him a pleasant man—I did not know what became of him after the attack.

Joseph William Duffield: I live at 1, Palace Gate Mansions, and am a plumber and decorator—according to the prisoner's statement I am the prisoner's uncle, but I have not seen him for thirty or forty years, when he was ten or twelve years old—if he is the man he says he is I married his mother's sister—if he is the man he says he is his correct name is Edwin Owen—his mother's brother, whose name was George,

lived and died a lunatic—he lived for many years with the prisoner's mother—the father of the prisoner's mother had a married sister who had been in an asylum, and who never regained her faculties—my daughter is at present in a private asylum; this is the name of it on this receipt for last quarter's charges—I have two other daughters who are now in a precarious position as to their mental health—I do not know what the result will be to them when they hear this horrible tale—I have sent one out of town to get out of the way this week—I knew the prisoner's father, he died a confirmed dipsomaniac—he squandered in drink the fortunes of his wife, his own two sisters, and his mother.

Cross-examined.—My wife's name was Eliza Sarah Freeman—her father's name was Henry Freeman, and the prisoner's mother's name was Helen Freeman—I knew my wife's father—he was of perfect mind all through his life—he had three sons and three daughters—the third daughter's name was Caroline—she was the lunatic—she left the asylum some years before her death and resided at home with her children.

James Scott: I am medical officer for Brixton Prison—the prisoner has been detained there since December 24th—he was put under close observation on January 1st—I have specially directed my attention to the state of his mind—I have seen nothing to indicate insanity.

Cross-examined.—I had some written statements as to the prisoner's family history, but I had no means of testing them—I have examined the prisoner; the shape of his head is somewhat peculiar, one part is more prominent, with a slight depression on each side—he says he had a fall about fifteen years ago—there might be some thickening of the bone, which might cause local pain—it would not necessarily affect his brain—it might lead to some affection of the brain but not necessarily to atrophy—cases where wholesale murders are committed are unusual—there might be strong original taint where insanity runs in collateral branches of a family—indifference to human life is frequently shown in cases of homicidal mania—insane men often use the same methods and have the same motives as sane men—they show a good deal of cunning and ability in concocting their schemes—people who become insane often have colossal schemes; the mind in a way is always at work; schemes which would be impossible to a sane man—a person might be suffering from homicidal mania and not show any outward signs that he is likely to commit a terrible crime—homicidal impulses would not last over any length of time—it is possible, but not usual for homicidal mania to return with uncontrollable impulses—cases of so-called homicidal impulses are not numerous—no murderer is normal, and it is very seldom that the motive for the murder is adequate—a murderer is a departure from absolute soundness, although not legally insane—I should not necessarily describe him as mentally weak—my opinion is that in this case there are things which a man who was in possession of his faculties might do. If there had been any thickening of the bone of the skull affecting the brain I should have expected to find symptoms of it—I found no symptoms of insanity in this case.

By the Court.—I have had considerable experience of observing

people, some of whom have turned out insane and some sane—I have had over twenty years of prison service.

Guilty.

The Prisoner: "Now get on with it as quick as you like."

Sentence: Death.

Disgust at the cold-bloodedness of the crime seems to the editor the only reason why Edwards was not found insane.

6. ALCOHOLISM AND LUNACY.

The Known Effects of Alcohol on the Brain.

The following propositions are abundantly justified by observed facts, and are fully admitted by all medical men who have studied the subject (Savage on "Insanity," Maudsley, "Responsibility in Mental Affections," and all other authors).

1. That alcohol can produce a condition of temporary alteration of the mind (known as drunkenness) varying in degree from a very slight alteration of the usual temperament (gay, morose, etc.), through a state of such gross alteration that the subject is lost to all control, ending in a condition of absolute unconciousness which may deepen into coma and death.

2. That the amount required to produce any of these states varies enormously with age, state of health, condition of brain, accident to head, etc., etc., etc.

3. That when a person, otherwise quite sound in brain, from accident or design habitually indulges in excess of alcohol, he may eventually become insane—in other words alcohol can actually cause insanity, usually a condition of dementia, but it may be some more active form of mania.

4. That a person's brain may, *ab initio*, be abnormal in that he has an irresistible (not unresisted) craving for alcohol; in other words insanity or degeneracy of brain sometimes is the cause and not the effect of indulgence in alcohol.

5. That when a person, no matter what his original state of brain may be, habitually drinks to excess he is liable to get an attack of *delirium tremens* (*a*) without other obvious cause than a bout of drink, or (*b*) sudden deprivation of drink, or (*c*) on meeting with some shock or accident, or (*d*) on being attacked by some diseases, *e.g.*, pneumonia. The patients with *delirium tremens* are often violent, and prone to commit suicide or murder—more commonly the former; hence they require close watching. Persons labouring under this disorder are incompetent to the performance of any civil act, unless the mind should clear up before death; they are not responsible for criminal acts committed while they are labouring under an attack. Acquittals have even taken place on charges of murder, when there was deliberation as well as an apparent motive for the act. Thus, then, although this disorder may have been voluntarily brought on by habitual drunkenness, the law admits it as a sufficient plea for irresponsibility, while in a case of confirmed drunkenness it rejects the plea. In *delirium tremens* there is an organic disease of the brain, while voluntary drunkenness merely produces a temporary disturbance

of its functions. A trial has taken place in which the evidence showed that homicide had been committed by the accused while labouring under an attack (*R.* v. *Simpson*, Appleby Sum. Ass., 1845).

Diagnosis of Ordinary Drunkenness.

As regards the diagnosis of drunkenness in any given individual case, it is practically impossible to lay down any hard and fast rules. Ability to walk straight along a line, to pronounce certain many-syllabled words, talk rationally on any ordinary subject, are amongst the commonly employed tests, and they usually suffice. Dr. C. G. Grant has in 1904 drawn attention to a very simple device which he speaks of with great confidence, viz., to get the patient to talk about his recent actions with reference to the time of day when they occurred. As Dr. Grant remarks, a man under the influence of alcohol rapidly loses his appreciation of time and will make the wildest guesses at it. For deeper points, when there is a question of 'drunk or dying,' *vide* the editor's "Differential Diagnosis," Macmillan.

Intoxication other than Alcoholic.

Intoxication is simply poisoning by alcohol, a light form of narcotic poisoning. A medico-legal question may arise in reference to the responsibility of persons for acts perpetrated while they are under the influence of other narcotics of a more powerful kind. Thus a person may have lost his self-control from the effects of opium or any of its preparations—Indian hemp, datura, chloroform, or substances of the like nature. If we except Indian hemp (bhang or gunja) and datura (by which muscular power may be excited), the general effect of other narcotics is to produce only a short stay of excitement, which is speedily followed by drowsiness, stupor, and muscular weakness. As a result of taking any of these drugs, a man may have hallucinations and illusions, and in this state commit murder like an insane person, who may fancy that he sees a hideous spectre or the devil before him. Chevers describes several instances in which murders have been perpetrated by persons who have taken preparations of hemp ("Med. Jurispr. for India," pp. 541 *et seq.*). Persons who voluntarily place themselves in such a condition as to be deprived of all self-control are in India held responsible: and whether the drug be alcohol, opium, or Indian hemp, is immaterial. Cases involving a question of this kind are not very common in England. At the Chelmsford Aut. Ass., 1861 (*Reg.* v. *Weaver*), a woman was charged with the murder of a child by strangulation. It appeared that this woman had perpetrated the act without any obvious motive, and it was proved that at the time she was in a half-stupefied or unconscious state. She was in the constant practice of taking laudanum, of which she had taken a large dose on the morning of the day on which the child was destroyed. It was suggested in defence that she was in such a state of mind as not to be responsible, but the jury convicted her of the murder. Unless there is proof of confirmed disease of the brain as a result of the practice, a person committing a crime while under the influence of drugs voluntarily taken, will no doubt be held as responsible for the results as if he were sane.

In recent years the practice of taking cocaine has grown to enormous proportions. It is but seldom that this form of chronic drugging comes before the criminal law, but a few further remarks will be found in vol. 2, under "Cocaine Poisoning."

Medical Views on Responsibility in Alcoholism.

Savage says: "A person, say, is given powerful stimulants, masked or concealed in some way; or being weak, or suffering from an old injury to the head, an amount which formerly would not have affected him now produces a great effect; in a state of acute alcoholism he commits a crime, and doubtless would be considered not guilty; but if he has experienced several times the danger which he incurs by taking stimulants even in small quantities, and yet continues to indulge, and then perpetrates a crime, he may justly be considered responsible, even although it may be proved that by inheritance, or in consequence of injury to the head, he is especially liable to be affected by stimulants. Next, if in consequence of intemperance he becomes slowly affected by mental disorder, and in a state of *delirium tremens* he commits a crime, he will probably not be considered fully responsible. If instead of *delirium tremens* alcohol produces chronic insanity or general paralysis of the insane, and in this condition of genuine insanity he does harm, he will not be considered responsible for his acts" ("Insanity," p. 465). The degrees of responsibility from drink are here fairly stated from a medical point of view, but when a case is before a legal tribunal the problem does not appear so simple.

Legal Views on Responsibility in Alcoholism.

The legal aspects of intemperance are very involved. Till recently it was generally held that drink was no excuse for crime. This doctrine must now, however, be modified; and it is held that total deprivation of self-control, or at all events delusions induced by excess, as in *delirium tremens*, renders an individual irresponsible for his actions.

The apparently contradictory judgments given by judges in regard to crimes committed under the influence of drunkenness—which last in some has been held to be a mitigation, in others an aggravation of the offence—led to the question being placed before Sir Henry James whether there is any general principle which is accepted by judges to regulate their decisions in cases where drunkenness seems to be an incentive to crime. In his reply, he at once states that he is unable to quote any general or definite rules on the subject of the extent to which drunkenness can excuse crime, or ought to increase or mitigate punishment. And he then proceeds to state his own views, and finally summarises them to the effect that in determining the legal character of the offence committed, drunkenness may be taken into account:—

1. Where it has established a condition of positive and well-defined insanity.

2. If it produces a sudden outbreak of passion occasioning the commission of crime under circumstances which, in the case of a sober person, would reduce the offence of murder to manslaughter.

3. In the case of minor assaults and acts of violence it never can form any legal answer to the charge preferred, but it may either aggravate or mitigate the character of the act committed—probably aggravate it.

4. As to the effect that should be given to drunkenness when determining the amount of punishment to be inflicted, no general rule can be laid down. Its existence may be considered, and may tend either in the direction of increasing or diminishing the punishment (*Times*, January 4th, 1892; *B. M. J.*, 1892, 1, p. 131).

Two cases which led to the above reference may be quoted: in one (*R.* v. *Williams*, C. C. C., 1886), Justice Denman ruled—

"That a crime committed during drunkenness was as much a crime as if it were committed during sobriety, and the jury had nothing to do with the fact that the man was drunk. The prisoner was supposed to know the effect of drink, and if he took away his senses by means of drink, it was no excuse at all."

In *R.* v. *Baines*, Lancaster Assizes, 1886, Justice Day ruled—

"If a man were in such a state of intoxication that he did not know the nature of his act, or that his act were wrongful, his act would be excusable."

Dixon Mann, "For. Med.," p. 359, remarks—

The fact that drink does not always affect people to a like degree constitutes a great difficulty. A man either from natural or acquired susceptibility may become maniacal under the influence of an amount of drink that would but slightly affect an ordinary man; such a man, under the influence of drink, is much nearer the condition of true insanity than that of outrageous drunkenness. The reply obviously is, that a man so constituted should not take drink, and that if he does, it is at his peril. Morally, the question is hard of solution; but the administrators of the law act in accordance with the view just enunciated, and punish the drunkard for committing a crime when he is partly drunk and partly insane, as though he was wholly the former. They are justified in doing so by the evil which would result if those who drink to excess were encouraged to believe that crimes committed under its influence would be lightly dealt with.

And with these views the editor is in thorough accord.

Civil Responsibility in Alcoholism.

When the mind of a man is completely weakened by *habitual* drunkenness, the law infers irresponsibility, unless it plainly appears that the person was at the time of the act, whether of a civil or of a criminal nature, endowed with full consciousness and reason to know its good or evil tendency. Any *deed* or *agreement* made by a party when drunk is not invalidated by our law, except in a case in which the intoxication has proceeded so far as to deprive him of all consciousness of what he is doing; and the law will not interfere in other cases, unless the drunkenness was the result of collusion by others for the purposes of fraud. When the drunkenness has occasioned a temporary loss of the reasoning powers, the person is incapable of giving a valid consent, and therefore cannot enter into a contract or agreement; for this implies *aggregatio mentium*, *i.e.* a mutual assent of the parties. In *Humfrey* v. *Maybury* (Q. B., July, 1857), an action by the plaintiff for work and labour, the evidence went to show that the defendant had caused the plaintiff while drunk to sign a letter which was pleaded as a set-off. The jury were directed to consider whether the plaintiff had signed it when so drunk that he had no contracting or disposing will.

The jury found in accordance with this view, and returned a verdict for the plaintiff. Partial drunkenness, therefore, provided the person knew what he was about, does not vitiate a contract or agreement into which he may have entered. Thus the law appears to divine two states in drunkenness: one in which it has proceeded to but a slight extent, and it is considered that there is still a power of rational consent; another in which it has proceeded so far that the person has no consciousness of the transaction, and therefore can give no rational consent. The proof of the existence of this last state would render all the civil acts of a person void.

Criminal Responsibility in Alcoholism.

A confession made by a man while in a state of drunkenness is legally admissible as evidence against him and others, provided it be corroborated by circumstances. In a case tried a few years since the prisoner confessed, while drunk, that he had committed a robbery and murder which had taken place some time before, but of which he had not been suspected. He mentioned a spot where the property of the murdered person had been concealed by him, and the whole of the circumstances of the murder. The property was found as he had described it, and the case was clearly brought home to him, chiefly by collateral evidence from his own confession. He was convicted. In a case tried at the Central Criminal Court, in October, 1849, a man pleaded his drunkenness at the time of his first marriage as a defence to a charge of bigamy. There was some evidence to show that he was partly intoxicated when the ceremony was performed; it was proved, however, that he was conscious of the whole of the proceedings, and he was convicted (*Med. Gaz.*, vol. 44, p. 762).

When *homicide* is committed by a man in a state of *drunkenness*, this is held to be no excuse for the crime. If voluntarily induced, whatever may be its degree, it is not admitted as a ground of irresponsibility, even although the party might not have contemplated the crime when sober (*Reg.* v. *Reeves*, Derby Wint. Ass., 1844). Inability to control his actions, in order to be admitted as an excuse for crime, must not be brought on by the act of the accused. Thus it appears that when the state of drunkenness is such that any civil act would be void, a person may still be held legally responsible for a crime like murder. Some judges have admitted a plea of exculpation when the crime has been committed in a state of frenzy arising from *habitual drunkenness;* but even this is not general. The question whether the person was or was not drunk at the time of committing a crime may be, however, occasionally of some importance. It was held by Patteson, J., that although drunkenness is no excuse for any crime whatever, yet it is of very great importance in cases in which there is a question of *intention*. A person may be so drunk as to be utterly unable to form any intention at all, and yet he may be guilty of very great violence (*Reg.* v. *Cruse*, 8 C. & P. 547). If the drunkenness has produced a diseased state of the mind, then a criminal act perpetrated by the person might admit of exculpation on the ground of insanity, or the want of sane consciousness at the time of the act; but the difficulty is to prove in such cases the existence of actual disease to a sufficient

degree to render the person irresponsible in a legal sense. When it is a question whether the accused was actuated by malice or not, a jury may under certain circumstances be required to take the fact of drunkenness into their consideration, and this may have some influence upon their verdict. While, then, drunkenness does not furnish any excuse for a crime, it may become material with reference to the *intent* with which an act has been perpetrated (*Law Times*, September 27th, 1845, p. 542). It is obvious that if drunkenness were to be readily admitted as a defence, the bulk of the crimes committed in this country would go unpunished.

In cases in which the head has sustained any physical injury, as among soldiers and sailors, drunkenness even when existing to a slight extent, produces sometimes a fit of temporary insanity, leaving the mind clear when the drunken fit is over.

Hallucinations and illusions are a common effect of drunkenness, and may lead to the commission of criminal acts. Marc relates a case where two friends being intoxicated, the one killed the other under an illusion that he was an evil spirit. The drunkenness of the accused was held to have been voluntary, and he was condemned. A case of this description (*Reg.* v. *Patteson*) was tried at the Norfolk Lent Assizes, 1840. A man while intoxicated killed his friend, who was also intoxicated, under the illusion that he was some other person who had come to attack him. It is reported that the guilt of the prisoner was made to rest upon the fact, whether, had he been sober, he would have perpetrated the act under a similar illusion. As he had voluntarily brought himself into a state of intoxication, this was no justification: he was found guilty of manslaughter.

The proof of drunkenness may fail, but still, if the party charged with the death acted under a delusion, he will be acquitted.

In *Reg.* v. *Price* (Maidstone Sum. Ass., 1846), it was proved that the prisoner, who had been on friendly terms with the deceased, was going home at night, having been previously in company with the deceased at a public-house. According to the prisoner's statement, a man sprang upon him from the hedge by the roadside, and demanded his money and his watch, or else he said he would have his life: the prisoner closed with him and beat him severely, inflicting such injuries that he died shortly afterwards. The supposed robber turned out to be his friend, and it was believed that he had made an attempt to rob the prisoner jokingly: the result, however, was that the attempt had ended in this fatal manner. The prisoner throughout told the same story, and there did not appear to be ground for believing that it was untrue.

Coltman, J., after hearing the evidence of the witnesses, said it appeared to be clear that the prisoner had acted under an impression that he was protecting his own life from the attack of a robber, and under such circumstances he could not be held to be criminally responsible. The jury accordingly returned a verdict of *not guilty*.

Restraint of Habitual Drunkards.

In former editions Dr. Taylor remarked: Drunkenness, even when habitual, is not a sufficient ground for the imposition of restraint or interdiction in the English law. He then quoted the following case, which is still of interest, for much the same principles still govern cases, though they are considerably modified by recent legislation (*vide* below),

and also by recently acquired knowledge of the effects of alcohol on the brain.

The case of Mrs. Armstrong (Q. B., February, 1858) presents some features of interest in reference to the alleged mental unsoundness of drunkards. The defendant, a lady, æt. 58, had been declared of unsound mind by a commission in August, 1857. In September she escaped, and went to France: she returned to this country in January, 1858, and endeavoured to set aside the verdict of unsoundness by these proceedings. It appeared that her father had bequeathed to her by his will two thousand pounds a year, to be paid to her monthly by trustees. The evidence showed that she was ill-educated, ignorant, and naturally of weak mind, amounting, according to some of the witnesses, to imbecility. For about ten years she had given way to habits of excessive drinking, and these habits, according to the evidence for the Crown, had still further weakened her intellect. She had been confined four times in lunatic asylums, and her unsoundness of mind had been certified by Arnott, Conolly, Winslow, and others. On the part of defendant it was contended that her mind was sound, except when she gave way to drunkenness, and that by the cessation of this habit she would be perfectly sane and competent to manage herself and property: further, that a mere drunkard could not and ought not to be deprived of his or her civil rights, unless it was proved that his mind had become permanently disturbed by his vicious habits, and this it was contended had not been proved of the defendant. Conolly, however, testified that, although she was a year under his supervision without any access to drink, her mind was still unsound. It appeared also that she exercised no control over herself in this respect; for when she escaped to France it was proved that she still drank brandy to excess, and for a month was drunk almost daily. Monro, Baly, Wood, and the author saw this lady on several occasions previous to the trial, for the purpose of testing her state of mind. They found her weak-minded, evasive, untruthful; and although sober at the time of their visits, it was clear from her admissions that she still drank wine and spirits in excess. She denied that she had ever been insane; and admitted that, although she had hoarded 3,200*l.* in sixteen months, she had not paid her tradesmen's bills, and had incurred a large debt at an hotel for which an action had been brought against her husband. She refused to give any account of the disposal of her money, or to furnish any explanation in reference to the large sum accumulated.

Having heard at the trial the evidence respecting her unsoundness previous to the inquisition, and having remarked an entire absence of proof that this had been removed when she was left to her own control, Monro, Baly, and the author came to the conclusion that from original weakness of intellect, aggravated by habits of drinking, she was still of unsound mind and incapable of taking care of herself or her property. Upon this declaration no witnesses were called for the defence; and the jury, who had an interview with the lady, returned a verdict that she was of unsound mind, two out of the twelve stating that her mind was sound, but that she was incompetent to manage her affairs on account of her habitual drunkenness. These two jurors therefore considered that she was a dipsomaniac. If this view were correct, she ought to have been discharged, as such persons are not subject to restraint or interdiction by the English law. There was no evidence, however, to show that she had recovered, while there was evidence that abstinence from drink at a former period had not led to her recovery. These dissentients must have based their opinion on their own personal judgment of her condition after a short interview.

An excessive indulgence in habits of drinking does not necessarily derange the mind, but it practically renders a person unfit for the control of himself and the management of his property. It is therefore a question whether it would not be for the benefit of such persons and of those dependent on them if the law interfered, and placed them

under the same restraint as those whose minds had been actually rendered unsound by this pernicious habit.

By the Inebriates' Acts, 1879 and 1888 (42 & 43 Vict. c. 19, and 51 & 52 Vict. c. 19), a person given to drink may voluntarily enter a retreat provided for such persons for a definite period, not exceeding twelve months; and having thus voluntarily placed himself under restraint, he cannot leave the house of retreat until the expiration of the stipulated time.

The Act of 1898 is thus commented on by the *B. M. J.*, 2, 1898, p. 1937: Though it cannot be denied that this third Act has disappointed the earnest desire of the profession and the public in containing no provision for the compulsory restraint of non-criminal habitual drunkards, the Act contains provisions so valuable for the remedial treatment of criminal inebriates as to bid fair to effect a revolution in our judicial procedure with criminal habitual drunkards of both sexes. Two groups of criminal habitual drunkards are, on and after January 1st, 1899, when the Act comes into operation, to be included.

Criminal Drunkards.—In the one group are embraced habitual drunkards convicted of an offence punishable with imprisonment or penal servitude. The convicted, in addition to, or in substitution of, any other sentence, may be ordered to be detained for a term not exceeding three years in any State inebriate reformatory, or in any certified inebriate reformatory the managers of which are willing to receive him. The Court is to be satisfied from the evidence that the offence was committed under the influence of drink, or that drunkenness was a contributory cause, and that the offender admits, or is found by the jury, to be a habitual drunkard. After a plea or verdict of guilty, the same jury is then, if there is no admission of habitual drunkenness, to inquire, without being sworn again, whether prisoner is a habitual drunkard.

Repeaters.—The other group consists of habitual drunkards who, within the twelve months preceding the date of the commission of a fourth offence, have been convicted summarily three times of any offence set forth in the first schedule. This group shall be liable, on conviction on indictment, or (by consent) on summary conviction, to be detained in any certified inebriate reformatory, the managers of which are willing to receive them, for a term of not more than three years.

The Two Classes of Inebriate Reformatories.—Procedure having been laid down, the Act goes on to the establishment and maintenance of two classes of inebriate reformatories. The Secretary of State is empowered to establish State inebriate reformatories, and for that purpose may, with the consent of the Treasury, acquire or appropriate land or buildings, or build, the cost to be paid from moneys provided by Parliament. The Secretary of State may also make regulations for the management of these State inebriate reformatories, and for the classification, treatment, employment, and control of the inmates, and for their absence under licence. The Prisons Acts, 1865 to 1898 (inclusive of their penal provisions), or as hereafter amended, are to apply to State inebriate reformatories, as if these were prisons, provided that no regulations shall authorise the infliction of corporal punishment.

Another class of inebriate reformatories, to be called certified inebriate reformatories, so long as the certificate is in force, may, on the application of any county or borough, or of any persons desirous of establishing an inebriate reformatory, be certified by the Secretary of State, who may make regulations for them also and for the inmates, and their transference to other reformatories, and may impose a fine not exceeding 20*l.*, or imprisonment for not more than three months, for a breach of the regulations. In reckoning the period of detention in a certified inebriate reformatory, the term of imprisonment is not to be computed.

The Secretary of State may appoint inspectors of certified inebriate reformatories whose salaries are to be defrayed out of funds provided by Parliament.

Escape of Inmates.—As to escape of an inmate from a certified inebriate reformatory, or from the charge of anyone under licence, before the expiration of his time, every officer authorised in writing by the reformatory managers to retake and recovery shall, for these purposes, have all the powers, protections, and privileges of a constable. The escaped can be apprehended without a warrant.

The provisions of the Act as far as expenses go were so unfortunate that much of the value of the Act has been destroyed, and it has not yet been found practicable to establish a State Inebriates Reformatory (*B. M. J.*, 1, 1899, p. 358).

In 1903 a blue book (Eyre and Spottiswoode) was issued as a supplement to the report of Mr. R. Welsh Branthwaite, one of the inspectors under the Act of 1898, in which will be found a good collection of statutes relating to the subject, with remarks by Mr. Branthwaite, and to which the reader is referred.

The article in the *B. M. J.* (*loc. cit.*) proceeds:—

Amendment of the Habitual Drunkards Act, 1879.—The Act of 1898 embodies several practical amendments of the Habitual Drunkards Act, 1879, two of which are of special importance. Voluntary applicants for admission to and detention in a licensed retreat can have their applications attested by *one* justice (instead of by two justices as previously), and the period of detention for which an applicant can apply is doubled, that is, extended from one year to two years.

The period for which a licence for a retreat may be granted is also extended from thirteen months to two years.

The licensing local authority hereafter will be, in a borough the borough council and the town clerk, and elsewhere the county council and its clerk, a county council being empowered to delegate any of its powers as a local authority to a committee.

By one amendment power is given to any county or borough council, and to two or more councils in combination, to contribute to the establishment or maintenance of a retreat under the Inebriates Acts, 1879 and 1888, as amended by the Act of 1898.

The extension of a term of detention, or readmission, may be granted on attestation by one justice, without a statutory declaration, the attesting justice not being required to satisfy himself that the applicant is a habitual drunkard.

The time between escape from and return to a retreat is not reckoned as part of the term of detention. A warrant for the

apprehension of a patient who has escaped from a retreat may be issued by any justice having jurisdiction in the place where the escaped patient resides.

In the case of a patient dying while absent from a retreat on licence, a certificate of the causes of death, with the name of anyone present at the death, by a registered medical practitioner, and copies thereof must be duly certified by the person in charge of the deceased, and sent by that person to the coroner, to the district registrar of deaths, to the clerk of the local authority, and to the person by whom the last payment was made for the deceased, or to at least one of the persons who signed the statutory declaration under the Inebriates Act, 1879. Failure to comply renders the person in charge guilty of an offence against this Act.

The Secretary of State is empowered to make regulations on all matters necessary or proper for carrying into effect the provisions of this or any other Act with respect to retreats, including the enforcement of work essential to health, and to substitute new forms if required.

(For a discussion on the relation of alcohol to mental disorder *vide B. M. J.*, 1903, 2, p. 816; and for a paper on the institutional treatment of inebriety *vide B. M. J.*, 1903, 2, p. 1204.)

7. FEIGNED INSANITY.

Insanity is frequently feigned by persons accused of criminal offences in order to prevent a trial, or to procure an acquittal or a discharge. In the first place, when feigning is suspected, it will be proper to inquire whether the person has any *motive* for pretending to be insane. In reference to persons charged with crime, it is necessary to remember that insanity is rarely assumed until *after* the commission of the crime and the actual detection of the criminal. No one feigns insanity merely to avoid suspicion. In general, as in most cases of imposture, the part is over-acted—the person either does too much or too little, and he betrays himself by inconsistencies of conduct and language which are never met with in cases of real insanity. There is commonly some probable cause to which insanity may be traced, but when the malady is feigned there is no evident cause: in this case the appearance of the assumed insanity is always sudden—in the real malady, the progress of an attack is generally gradual; and when the attack is really sudden, then it will generally be found to be due to some great moral shock or other very obvious cause. We should observe whether for some time previously there has been any marked change of character in the person, or whether his conduct, when he had no interest to feign, presented any of the usual indications of insanity. Some difficulty may arise when fits of eccentricity or strangeness of character are deposed to by witnesses, but these statements may be inconsistent with each other, and the previous acts of the person may bear no resemblance whatever to those performed by him in the recently assumed condition. A difficulty of this kind rarely presents itself, since in an impostor no act indicative of insanity can be adduced for any antecedent period of his life: it is only *after* the perpetration of a crime and its detection, that any action approaching to the habits of

the insane will be met with. In real insanity the person will *not* admit that he is insane; in the feigned state all his attempts are directed to make people believe that he is mad.

The following is a good illustration of an impostor *saying* he was insane, which in itself is almost a proof of malingering (*R.* v. *Rowe*, C. C. C., March, 1903):—

Before Mr. Justice Grantham, William Rowe pleaded guilty to feloniously wounding Charles Norman with intent to murder him. [(The prisoner stated that he was not responsible for his actions at the time; Dr. Scott, the medical officer at Brixton Prison, stated that he considered the prisoner sane, and his stupid manner to be assumed. Seventeen previous convictions were proved against him.) Ten years' penal servitude.]

And an impostor may be induced to perform any act, if it be casually observed to another in his hearing that the performance of such an act will furnish strong evidence of his insanity.

At the Northampton Assizes in November, 1897, a silly case of shamming lunacy occurred before Mr. Justice Wills, who remarked it was one of those difficult cases where one could hardly tell whether the prisoner was a violent lunatic or one of that class of persons, which the prison surgeon evidently thought he belonged to, who were half mad, and more than half bad. He was, however, a very dangerous man to have at large. If the man really was a lunatic he would be removed to some place where he would no longer be punished, but properly cared for. On the other hand, if he were sane he was a very violent and dangerous man. Verdict, ten years' penal servitude.

A judge once said:—"It may be safely held that a person feigning insanity will rarely, if ever, try to prove himself to be sane; for he runs the great risk of satisfying others that he is sane, a conclusion which he obviously desires to avoid. But there is no better proof, in general, that the insanity (supposing other evidence of it to be strong) is real, than keen and eager attempts by the accused to prove that he is sane, and strong and indignant remonstrance against being held to be insane, although they would protect him against trial and punishment."

A trial took place at the Chelmsford Lent Ass., in 1873, in which a clergyman was indicted for a violent and unprovoked assault on a policeman. When a suggestion was made that his conduct was that of an insane person, he protested strongly against the jury returning a verdict to that effect. He would not allow this defence to be set up for him. His conduct, however, in court left no doubt that he was then of unsound mind as well as when he committed the assault, and the jury, in spite of his strong protestations, acquitted him on the ground of insanity.

The Lord Chief Justice stated that this man had formerly been confined as a lunatic. The conduct of an impostor would have been the reverse of this. In a case which occurred in Edinburgh some years since, a doubt existed whether the person was feigning insanity or not.

Those who were about him, and had charge of him in gaol, were satisfied, from his clearness and apparent coherence, that he was quite sane, and that what he exhibited was merely eccentricity or simulated attempts to act as a madman. Insane he certainly was, however, beyond all doubt; but he fought the point of his sanity most bravely in court, and made very clear and quick remarks on the evidence of the medical men, who had no doubt of his insanity. When one physician of great experience with insane persons stated that he thought him quite incapable of giving information to counsel and agent for conducting his defence, he said instantly, "Then why did you advise me to apply to and see counsel and agents?"

Mania is perhaps more frequently assumed than any other form, because the vulgar notion of insanity is that it is made up of violent action and vociferous and incoherent language; but mania rarely comes on suddenly, or without some obvious cause. A maniacal patient is also equally furious by day and night, while an impostor is obliged to rest after his violent exertions. Burrows recommends that close attention should be paid to the expression of the eye. The mobility of the features may be as rapid as the imagination is vivid; but when every feature may vary, or be kept under control and be steady, the eye will still indicate the erring thought—its expression cannot be easily assumed. There is about the eyes in mania a restlessness which cannot fail to attract attention: the patient sleeps but little, and the sleep is disturbed—an impostor sleeps on as soundly as a healthy person. The violence of a maniac continues whether he is alone or not, while the impostor acts his part only when he thinks he is observed: hence the impostor may be detected by watching him when he is not aware that an eye is directed upon him.

In investigating a case, some stress has been laid on the fact that assumed insanity commonly appears suddenly and without probable cause; but while this may be allowed to have a general influence in forming a medical opinion, it is proper to bear in mind that the actual commission of a crime has sometimes suddenly led to an attack of mania in a previously sane person. Pagan has related a singular instance of this kind.

Two men were committed to prison on a charge of theft, and the officers requested a poor man, who was a shoemaker, to assist them in conveying the prisoners. This man took a gun with him for better security. During the journey one of the prisoners leaped from the cart and ran off. The officers called to their assistant to fire, and he, thinking himself warranted to do so by their order, fired, and wounded the prisoner severely in the back and loins. The man who fired the gun was himself immediately committed to gaol as a criminal, and this event made such an impression upon him that he became violently maniacal, but it was supposed that he was only feigning insanity. When scarcely recovered he was tried for the offence, convicted, and sentenced to six months' imprisonment ("Med. Jurispr. of Insan.," p. 82).

This case proves that a person may really be attacked with mania under circumstances in which a justifiable suspicion would be likely to arise that he was feigning.

The feigning of *monomania* is a matter of some difficulty: it would be easily susceptible of detection. As in mania the part would be overacted, and an impostor would thus betray himself. *Dementia* is more easily feigned: in general this state comes on slowly, and is obviously dependent on organic changes, as old age, apoplexy, paralysis, or hemiplegia; or it is a consequence of recurrent mania or monomania. As this form of insanity consists in an entire abolition of all mental power, so the discovery of any connected ideas, reasoning or reflection, either by language, writing, or gestures, would at once show that the case was not one of real dementia. *Idiocy* and *imbecility* could hardly be feigned successfully, because these are states of congenital deficiency, *i.e.*, they must have existed from birth. Hence it would be easy to show, by reference to the antecedent life of a person, whether he has or has not always been such as he represents himself. There is another fact worthy of notice. An impostor cannot long maintain his

part. If the case is really of long duration without material change in symptoms and conduct, it is more likely to be one of real than of feigned insanity. The difficult cases of feigned insanity are really limited to those forms of the malady which are liable to attack a person suddenly. But for a sudden attack of real insanity there should always be some obvious cause, and the non-existence of this, with the presence of a strong motive for deception, will justify a suspicion that the malady has been assumed.

The following case of feigned insanity was the subject of a trial in London :—

A married woman, aged fifty, was charged with uttering a forged cheque : she had craftily procured the signature of a person under a false pretence, and then forged his name to the cheque. When required to plead she made no answer, and appeared unconscious of the question. She took up some flowers placed in the dock, and crumbled them in her fingers, which were in continual motion. She stared wildly at times, changing her position—turned her back on the court—muttered indistinct exclamations, and made a humming noise. She was placed under some restraint in order to prevent her from jumping out of the dock. The first question which the jury were directed to try, was whether she was "of sound mind or not"—it being a rule of law that no insane person can be called on to plead to a criminal charge. Evidence was then adduced to prove that at previous periods of her life she had used incoherent language and was strange in her conduct. It was also shown that her mother, aunt, and sister had been insane. Uwins deposed that at first he thought the prisoner was feigning, for she appeared to be fully aware of the importance of the plea of insanity; but when he heard that other members of her family had had the disease, he was induced to think her insane, and therefore not accountable for her actions. Another medical witness, who had attended her family professionally, and had known the prisoner long, thought she was not insane, although he allowed that the apprehension of a criminal charge might bring on an attack of insanity in a mind subject to aberration. Other witnesses deposed that they had never observed any acts of insanity about her; and it was further proved that she was well acquainted with the method of drawing and procuring money on bills. When arrested she tried to escape from the officer, and to conceal the money which she had procured by means of the forged cheque. The surgeon of the gaol thought she was feigning ; he visited her daily, and he observed that her manner was changed as soon as she saw him. When asked what counsel she would employ, she returned a rational answer, saying that "others would take care of that : " when charged with feigning she made no observation. She put on a wild look when she knew that she was observed, but when privately watched her behaviour was like that of a rational person ; she generally slept soundly. The jury found that she was of sound mind; she was then called on to plead to the charge, but she refused—a circumstance rarely observed in the conduct of a really insane person. She was tried, and found guilty.

There could be no reasonable doubt that this woman was an impostor, and that she feigned insanity, well knowing what would be the result of the plea, if admitted. Two circumstances rather tended to complicate the case : 1st, the proof of hereditary predisposition ; and 2nd, her assumed silence, whereby she did not easily betray herself. In regard to hereditary predisposition, although valuable as collateral evidence, it cannot of course be allowed to outweigh general facts indicative of perfect sanity. This case proves the fallacy which is liable to arise from the unrestricted admission of such evidence (*vide supra*, p. 819). With regard to the taciturnity or "silence," there is no symptom more easily assumed. A person has only to keep the mouth shut and not heed the questioner, and this requires but little art or exertion. It is also easy to stare wildly and put on an aspect of unconsciousness. Observation of the countenance, especially of the

eyes, while others are conversing on matters affecting the reputed criminal, will show whether there is an intelligent understanding of what is said in his presence or not. Stahmann has pointed out, with respect of the simulation of the dirty habits of the insane, that an impostor will be dirty in his cell or bed, but rarely in his person, while in real insanity the patient is usually dirty in both ("Ann. d'Hyg.," 1867, 2, p. 430).

If the person can write, he might be induced to draw up an account of himself, which would certainly indicate the real state of the mind. Marcé has shown that in the different forms of real insanity the writing presents characters which cannot easily be mistaken ("Ann. d'Hyg.," 1864, 1, p. 379).

There is one simple rule to be followed in an examination. We should never prejudge the case, or go with a set purpose to find proofs of sanity or insanity in accordance with the views of those who consult us. As in reference to the detection of malingerers, we should receive and weigh every statement with due care and attention, so as to protect the patient against unjust suspicions, and at the same time secure his confidence (*Lancet*, 1872, 1, p. 93). Born has reported a case in which the question of simulation was raised, but he affirmed, after a minute investigation of all the circumstances, that it was really a case of monomania (Casper's *Vierteljahrsschr.*, 1865, 2, p. 308).

At the Lewes Winter Assizes, Dec., 1856 (*R.* v. *Ball*), the prisoner, a ticket-of-leave convict, was convicted of housebreaking. The case of this man shows how easily medical practitioners who have had but little experience of insanity may be deceived by skilful impostors. After the prisoner had been committed to gaol he simulated madness so successfully that he deceived three of the visiting justices and two medical men; and a certificate was about to be signed for the removal of the supposed unfortunate lunatic to an asylum, when the deception was discovered by the impostor having made a confidant of one of his fellow-prisoners. He had been convicted of robbery at Leicester in 1851, and sentenced to transportation: he was sent to Millbank Prison, where he feigned insanity and succeeded in deceiving the medical officers there: they certified that he was a lunatic, and he was accordingly removed to Bethlem Hospital, where he remained two years. He subsequently received a ticket-of-leave.

The clinical thermometer may also be of assistance if it can be used, for in real madness the temperature is usually normal or sub-normal; in the madness of bodily disease pyrexia is almost constant; in feigned mania a slight elevation is possible.

Among modern cases in which that form of insanity known as dementia was alleged to have been feigned is that of Lady Mordaunt (*Mordaunt* v. *Mordaunt*, Divorce Court, Feb., 1870).

In consequence of a confession made by this lady soon after her confinement that she had committed adultery with certain persons, her husband took proceedings against her for a divorce. At the date at which she was served with notice of the writ, April 30th, 1869, it was alleged that she was insane, and that from mental incapacity she was unfit or unable to instruct an attorney for her defence. On the part of the husband, it was alleged that she was really fit and competent, and that the state of insanity was assumed in order to avoid the exposure of a public trial ("The Mordaunt Divorce Case, Official Rep.," 1870, p. 108).

As the case is a very typical one of the difficulties that may surround the plea of lunacy, the editor leaves it as Dr. Taylor originally presented it.

Lady Mordaunt was confined on Feb. 28th, 1869, and on March 9th she informed her husband that the child was not his. He treated this statement at first as a delusion, but from circumstances which afterwards came to his knowledge he believed it to be true. The nurse who remained with her a month stated in her evidence that she had not observed the least appearance of insanity about her. Orford, who attended her in her confinement and until March 18th following, deposed that there were no symptoms of puerperal mania or of fever, and there were no delusions. He considered her to be shamming on March 8th after her confinement, and more or less from that time until May 13th. The only symptoms exhibited were silence and a fixed look. This witness saw her at Worthing on July 10th. There was nothing then to lead him to believe that she was not in her senses. There was no sign of madness about her at any time. He had seen her recently. Her present state was that of a mind altogether gone. She could not apprehend anything that was said to her. ("Rep.," p. 86.) Jones saw her on the 10th, 11th, and 12th, and up to March 26th, and there were no symptoms of puerperal mania, nor any sign that she was suffering from insanity. He saw her twice in April (on the 26th). Her mind was sane, and she answered questions rationally and reflectively. He saw her on May 12th, and he believed her then to be generally sane. He again saw her on July 10th. He could with difficulty get any answers to his questions, but when he did they were rational. He saw her a few days ago. He could get no answer to a question. She threw herself on the hearthrug. He then thought that her mind was impaired. Tyler Smith, who was called as an expert, said there was no evidence of puerperal mania following the confinement, and there was an absence of insanity at the time spoken of by the two preceding witnesses. He saw Lady Mordaunt twice in December, 1869, and he saw no symptom in her which might not easily have been feigned; but he would not go further than that. Assuming that she was not feigning, the appearances might be those of dementia.

The evidence for the petitioner thus tended to show that from the date of the confinement until December, 1869, there was nothing to prove that Lady Mordaunt was insane or incapable of exercising her mind. On the other side, evidence was adduced to show that Lady Mordaunt was incompetent. Three women, who had acted as attendants from May 17th to August 31st, and subsequent dates, deposed to certain filthy habits inconsistent with sanity. She destroyed her clothes, and there was a want of personal cleanliness.

Priestley saw her on May 6th with Alderson and Tuke. She was taciturn. She made no reply to questions. On the 16th, 17th, and 18th May, Priestley again saw her twice with Gull. They agreed she was of unsound mind, and quite incapable of managing her own affairs. Her memory was almost annihilated. She could be made to understand only the simplest things. Priestley certified that she was "suffering from puerperal insanity accompanied by delusions," one of them being that she was still mistress of her own house, when her husband, Sir Charles, had permanently left her. ("Rep.," p. 14.) Tuke saw her with the former witness on May 6th. He thought her suffering from puerperal insanity tending to dementia. Neither of these witnesses had seen her since that date. Alderson saw her on May 6th. His conclusion was that she was then of unsound mind. He again saw her at Worthing with Gull on July 3rd. She had a vacant look, a fixed attitude, and scarcely gave a rational answer to any question. Simpson saw her on April 14th, 1869, and in February, 1870. He found her fearfully insane, a mere wreck and ruin of the mind, but in good bodily health. In his opinion she was utterly insane, and the insanity had commenced before her confinement. In his view it was a case of puerperal insanity, in which state self-accusations of impropriety were common. Gull saw her first in May, 1869, and several times subsequently. She had no "mental comprehension, and rarely uttered two consecutive sentences." He saw her last in January, 1870. "She was incapable of mind." The symptoms he saw might have arisen from any form of insanity. Some cheques were shown to this witness which, with the exception of the two most recent, were, he said, reasonably drawn and carefully filled up. He considered the question of simulation, but could not arrive at an affirmative conclusion. The strongest evidence against simulation was, in his opinion, the uniformity of her condition and her incapacity to take in ideas. Barrows saw her with Reynolds on July 10th at Worthing, at the request of Sir C. Mordaunt's solicitor, and in company with Orford and Jones. He concluded she was then unable to give instructions to a legal adviser. She would only answer repeated questions. He thought her mind had been progressively deteriorating, and that she was then in a state of dementia. Reynolds put questions, but had to repeat

them several times before obtaining answers. He could not arrive at any conclusion. He had seen her since several times under an order of the Court. He thought there was either extreme disease or extreme shamming, and after all he had seen he thought the former. He tried to detect simulation, but never saw any breach in her demeanour. In answer to the court he said, "It is an unusual case, and there are some points of contradiction in it, such as the amount of intelligence shown up to a certain point coupled with the uncleanliness which is generally confined to extreme cases of dementia. She can play an air and sometimes answer sensibly on common things, and can write letters." (It was this inconsistency which for some time made him doubtful.)

Wood, who was appointed by the court, saw her on September 18th, and considered that she was then "suffering from an arrest of mental power, not strictly imbecility or dementia. It is impossible that any human being should have carried out such a system of deception as that suggested by the petitioner. Lady Mordaunt's conduct was invariably consistent, whereas the most practised artist would have been betrayed into tripping. Simulation would have been betrayed by inconsistencies. Puerperal insanity may occur during pregnancy, at confinement, or during lactation. In the majority of cases it is more or less progressive. It is possible that Lady Mordaunt, though suffering from mania, was sane at the time of and after her confinement."

The verdict of the jury was to the effect that on April 30th, the respondent was totally unfit to instruct her attorney, and had been unfit ever since.

In reference to this remarkable case, it will be perceived that the medical witnesses on both sides agreed that at the time of the trial and for some time previously Lady Mordaunt was of unsound mind, but her mental condition from the date of her confinement to April 30th was left untouched by the verdict, and can now be only a matter of inference from the medical evidence. The witnesses, acting as attendants, who gave evidence of her filthy habits and her unreasonable conduct, came after this date, and therefore could throw no light upon her mental condition. Until after this date, no reasonable motive could be suggested for her feigning insanity. There was then a strong motive for preventing a public exposure by trial. It was in the three weeks following this date, during which she had to answer the citation served upon her, that she was seen and examined by the greater number of scientific experts. The medical opinions given by them regarding her condition in the months of March, April, and May are conflicting. At this time Orford, her usual medical attendant, observed nothing the matter with her mind, and believed that she was shamming. Jones, another medical attendant, agreed in this view, and said that her state was inconsistent with any kind of mania he ever saw. Tyler Smith, as an expert, confirmed these gentlemen in their opinion that the symptoms were not those of puerperal insanity. Priestley, who first saw her nine weeks after her confinement, thought she was then suffering from puerperal insanity with catalepsy; Tuke, puerperal insanity tending to dementia and from catalepsy. Simpson saw her six weeks after her confinement, and considered her to be "utterly insane." Gull thought that her symptoms might arise from any form of insanity. Burrows (in July) thought she was in a state of dementia. Reynolds said it was a case of extreme disease or extreme shamming. He could not detect simulation. Harris saw her on May 22nd, and attributed her condition to puerperal mania. Hughes (August 25th) thought her case was one of puerperal mania. She had no mind or memory, and was unable to converse. Wood (September) said that she was suffering from an arrest of mental power, not strictly imbecility or dementia.

The judge, in his address to the jury, put aside all these conflicting medical opinions. "He did not know a more difficult definition to express in words than that of insanity." . . . There was, he thought, as much variety in mental as in physical disorder. Instead of asking them to say whether the lady was mad or insane, he would wish them to consider whether she was or was not in such a state of mental disorder as to prevent her giving instructions. They found in the affirmative.

The subject of the simulation of insanity has been treated by Laurent ("Ann. d'Hyg.," 1866, 2, p. 460). He places great stress on a close attention to the physiognomy of the insane, which cannot be simulated, and in the absence of sleep, generally so characteristic of insanity, and not observed in the impostor. He advises the complete isolation of the person, with daily watching, for a certain time, as a method which seldom fails to detect the imposition, while it cannot injure the really insane. One remarkable circumstance he points out, namely, the influence of feigning insanity on the feigner. He is of opinion that persons who have for some days or weeks pretended that they were insane have become in the end really insane. In support of this view he quotes the cases of two sailors who had feigned madness in order to escape imprisonment in the hulks. The imposture was at first crowned with success, but in the end it had an unfortunate result, for they became really mad (*op. cit.*, p. 462).

The impostor must be ever on the watch that he does not fail on any one point. This creates a great strain on the mind, and with the anxiety attendant on the maintenance of such an imposition at all times and under all circumstances he may suffer from cerebral exhaustion with its worst consequences.

In hysteria and neurasthenia the question of deliberate malingering is often brought before medical men, but belongs too closely to clinical medicine to be further noted here. The reader is referred to large works on clinical medicine under the headings of "Hysteria," "Neurasthenia," etc.

FEIGNED DEAF-MUTISM.

For the same purpose of evading responsibility persons may feign to be deaf and dumb. Such cases of malingering come much more frequently before the medical man in his primary capacity than when acting as a witness, but they may be noted here. Occasionally they crop up in police-court cases where the minor offence, say, of begging is in question, or extorting charity by false pretences. It will be found that the alleged deafness and dumbness did not come on until a motive for feigning existed, and that there was no apparent cause but the very suspicious one of evading responsibility for some offence committed. The use of ether or chloroform vapour may be occasionally resorted to with advantage for the detection of such an imposition.

In one instance a strong shock of the induced current from a magneto-electric apparatus, by means of moistened conductors applied over the larynx, brought out after a few minutes the power of speech in a lad who had successfully imposed on many persons (*Med. Times and Gaz.*, 1861, 1, p. 339).

It requires great skill to maintain an imposture of this kind. Such persons are immediately thrown off their guard by addressing them in

a voice a little above or a little below the common conversational tone; a change in the eye or the features will at once indicate that they hear and understand what is said. An ignorant impostor may be dealt with on the principle of "*ars est celare artem*," by seriously proposing in a low voice to a medical friend who may be present the necessity for the performance of some formidable surgical operation. The production of amputating instruments has been known to have a wonderful effect.

On one occasion a pauper feigning deafness and dumbness was detected by the production of a case of surgical instruments during a consultation between two surgeons as to the immediate performance of an operation upon him.

In *R.* v. *Yaquierdo* (Herts Sum. Ass., 1854), the prisoner, who was charged with wilful murder, was found by the jury to be wilfully mute. The man refused to plead, although it was obvious that he was well aware of the nature of the proceedings. No counsel could be assigned to him, as this could not be done without the prisoner's consent. He was convicted. Wilson mentions the case of an impostor who had succeeded in convincing all around him that he was completely deaf. His medical attendant prescribed for him daily extra wine and other articles of dietary, but in reality he ordered that none of them were to be supplied. The consequence was that whilst the patient was nominally living on the fat of the land, he was actually suffering from hunger. At last the surgeon remarked that he could not understand why the patient seemed to be losing flesh with such a diet. This proved too much, and the pretended deaf man, in an unguarded moment, indignantly exclaimed to the nurse, "You know I have never had any of those good things" (*Lancet*, 1872, 1, p. 93).

If the impostor can write, he may perhaps be detected by the ingenious plan adopted by the Abbé Sicard.

Under the old system when the deaf and dumb are taught to write they are taught by the eye. The letters are only known to them by their form, and their value in any word can be understood only by their exact relative position with respect to each other. A half-educated impostor will spell his words, or divide them incorrectly; and the errors in spelling will always have reference to sound—thereby indicating that his knowledge has been acquired through the *ear*, and not alone through the eye. A man who had defied all other means of detection wrote down several sentences, in which the misspelling was obviously due to errors produced by the *sound* of the words; the Abbé pronounced the man to be an impostor without seeing him, and he subsequently confessed the imposition.

SECTION XIV.

LIFE INSURANCE—GENERAL AND ACCIDENTAL.

SUB-SECTION A.—GENERAL LIFE INSURANCE.

The subject of life insurance in a medico-legal view was at one time almost peculiar to the medical jurisprudence of Great Britain; but this is no longer the case. American competition has advanced the science of life insurance enormously, and multiplied the companies many times over.

The insurance of a life is a contract whereby the insurer, in consideration of a certain sum of money, called a *premium*, either in a gross sum or in periodical payments—proportioned to the age, sex, profession, health, and other circumstances of the person whose life is insured—undertakes to pay to the person for whose benefit the insurance is made a stipulated sum or an equivalent annuity, upon the death of the individual whose life is insured (or on his obtaining a certain age, whenever this event shall happen), if the insurance is for the *whole* life; or, in case death shall happen within a certain period, if the insurance is only for a limited time.[1]

Policies are now issued of almost every conceivable variety, each company vieing with every other one to attract custom by the variety, and advantageous proposals, of its policies; even diseased lives are now taken with loading (*vide* Pollock "Handbook to Life Insurance," and Havilland Hall, "Med. Exam. for Life Assur.," Symes-Thompson in "Allbutt's System of Medicine," 1, p. 476, also Schooling, "New Aspects of Life Assur.," *Journ. Soc. of Arts*, 1903), and even an old office like the Sun offers policies without medical examination at all.

The deed by which this contract is made is called a *policy*, and it is concerning the stipulations of the policy, and the meaning to be put upon certain medical terms used in it, that litigation commonly arises. The amount of premium payable will be regulated by the *mean expectation* or duration of life of the individual[2]; and this it is well known is not only different at different ages, but is greater at certain periods of life among women than among men. Profits accrue to the companies by charging premiums slightly higher than those actually required, and also by money paid on policies which through accident or design lapse.

The sum for which a person's life has been insured, if payable on

[1] In legal parlance a life or other object is *insured;* the person who will receive benefit is *assured.*

[2] For the explanation of mean expectation of life and other terms used, *vide*, Dr. Newsholmes' second series of "Vital Statistics," including life tables based on the vital experiences of the ten years 1881—1890, and the ten years 1891—1900, reviewed in the *B. M. J.*, 2, 1903, 1223.

the death of the individual, cannot be recovered until distinct proof of death has been furnished. Those who would benefit by the death must prove the fact of death when this is open to doubt.

Frauds by bogus deaths are by no means extinct: a common plan now is to insure a life, put the assured to bed as ill, send for a doctor, and in a few days inform the doctor that the patient is dead, ask for a certificate, bury a coffin full of stones or another body, and then enjoy the proceeds; the only medical question arising in such cases is the carelessness in a medical man of signing a certificate without seeing the body. Such a bogus death was the case of C. W. Browning (1901).

Death certificates are boldly forged in some cases: for instance, in January, 1904, at the Old Bailey, Frederick Augustus Cooke, for forging a death certificate and defrauding an insurance company, was sentenced to three years' penal servitude.

The Policy is a Contract.

As in the case of all civil contracts, the law requires that there should be a strict compliance with the conditions by each party, it follows that, if any fraud has been committed by the assured—if he, and those to whom he trusted in his dealings with the office, have concealed from the insurers the existence of any disease under which he was at the time labouring, or any symptoms indicative of a probable attack of disease—or if he or they have knowingly and wilfully misrepresented or misdescribed his actual bodily condition, then the contract will be void, and the amount of the premiums forfeited. This forfeiture is a usual condition in the policy. Actions on policies of life insurance are not infrequent, though disputes are usually settled by arbitration; and, unfortunately, the medical evidence given on these occasions, as in cases of insanity, is of a very conflicting character. This is by no means creditable to the profession, for it either proves the existence of great bias in the witnesses, or that medical rules are devoid of all certainty, and are therefore practically useless. One of the evils of these professional conflicts is that juries are discharged without verdicts, and both parties are put to great expense.

In a case of life insurance an action is never likely to be brought for the recovery of the amount of a policy, except when there is reason to believe that a wilful fraud has existed in the alleged contract. Juries always regard such actions with disfavour; and while judges interpret the law strictly, the onus of proof is entirely thrown upon the offices. Hence the assured are placed in a very advantageous position. These actions in nine cases out of ten depend upon the construction put on the medical terms of the contract; hence it is our duty to see how medical defects are likely to arise in reference to the policy. The conditions of insurance vary in different offices, and with the particular variety of policy which is taken up by the assured. The questions to which replies have to be given may be roughly divided into general and special.

General Replies.

With regard to what may be called the general questions there is nothing of any particular medical interest in them, but the editor inserts the following case in full, as a warning to would-be insurers to

be scrupulously accurate in their replies, and to err on the side of giving unnecessary particulars rather than in the omission of any facts, however trivial they may seem.

The report is given in the *ipsissima verba* of the assured, followed by a report of the proceedings from an independent observer, dated November 26th, 1901.

"I am a medical practitioner of twenty years' standing, am married and have a family of seven. For nearly fifteen years I practised in Scotland, and came to London in March, 1899. While in Scotland I was insured at different times against accidents with three different companies, and during all those years I claimed for minor accidents various sums, amounting in all to about 10*l.*

"On 31st May, 1900, on the advice of a patient, I made a proposal to insure against accidents, with Company A., having allowed my Scotch policies to lapse. The agent to whom I sent the proposal form was a complete stranger to me. He acknowledged receipt of it, but stated that he was going on a holiday and would see me on his return. About two days after the proposal was signed, I narrowly escaped a serious accident while riding in my carriage, through the horse bolting. This incident made me more anxious than ever to effect an insurance, and as my proposal to Company A. was only for 500*l.*, and my practice was at least a 1,000*l.* one, I made a fresh proposal to Company B. for 1,000*l.*, as I was in doubt that the agent of Company A. would call to see me, and in any case I considered that an insurance for 1,000*l.* or 1,500*l.* for the loss of a limb or an eye would not possibly in my profession be looked upon as over-insurance. In the proposal form of Company B. a question is asked: 'Are you now insured with any other company, or are you proposing to insure?' As I had no information of my proposal to Company A. having been sent on to the company, my answer to the question was '*No, but may propose.*' I might if space had permitted have stated that I had filled up a proposal form for Company A. and had sent the same to a commission agent or broker, who, however, had gone on holiday, and might or might not complete the transaction. I merely answered 'No, but may propose.' This answer I considered frank and truthful, as it gave Company B. the opportunity of asking a further explanation, or of saying, 'Well, we cannot have you, if you contemplate proposing to another company.' Company B., with that answer, accepted me, which I considered tantamount to saying, 'We accept you in the full knowledge that you may propose to another company.'

"Subsequent to my acceptance by Company B., I learned that I had been also accepted by Company A. Without further thought, believing that I had answered all the questions truthfully and to the best of my knowledge, I put aside in my desk both policies. Engrossed on the back of each policy there is a long list of printed conditions. These I did not read, and I quite believe that very few who insure ever do, but they are important.

"It is somewhat anomalous that these conditions are not supplied to the assurer before the contract is completed. Once completed, the assured is legally bound to those conditions, but on this subject more anon.

"Unfortunately, on 9th July, 1900, while doing microscopic work, my stool slipped, and an open lancet pierced the globe of my right eye. A neighbouring practitioner was in immediate attendance, and early next morning I placed myself under the care of a distinguished Harley Street specialist. All treatment was of little avail, and after the lapse of six weeks, enucleation became necessary. Notice of the accident was given to each of the companies in the ordinary course, each company being made aware at the same time that I was insured with two companies, A. and B. No objection was made to my claim until they learned that I had lost the eye; then I was astounded to find, on calling at each of the offices, that my claims were not admitted; objected to on the grounds that neither at the time of proposal, nor prior to the accident, had I informed A. that I was insured with B., or *vice versâ*.

"Had I been desirous of being dishonest I need not at the time of the accident have disclosed the fact to A. that I was insured with B., or *vice versâ*. If the conditions had been supplied to me prior to the policies being granted, I would have been placed in the position of knowing that any additional insurances should be notified. As it was, these conditions were only submitted when the contract was fixed. It may be said that I ought to have read those conditions after the policies had been granted. True, but I did not. I merely did what most lay assurers do, and certainly what many busy professional men would do, viz., put them in their desks, hoping to read them at a more convenient season.

"Unfortunately my accident occurred rather sooner than anyone would have expected, and hence the commencement of the legal quibbles and technicalities.

"The first great difficulty that confronted Companies A. and B., and which they gently hinted was almost the only reason which prevented them from paying my claim, was that they had underwritten part of my policies with Companies C. and D., and that these latter companies objected to pay their portions, because of inaccuracies in my proposal forms. One of the inaccuracies was that I had stated that in Scotland I had been insured with two companies instead of three, and that I had wrongly named one of them, although my designation of the company, on which I relied only on my memory, was sufficiently clear to show which company I meant. The third company I had entirely forgotten, and could not remember, even when told that it was the case that I had been insured for a short time with it. The other objection was that I had not, according to the conditions, notified the double insurance to A. and B. I protested against these objections and appealed to the Law Courts, but was informed instantly that, according to the same conditions, I must submit the whole facts to arbitration. I was helpless, and therefore agreed. Lengthy and costly arbitration proceedings were at once commenced, ending in both cases in awards in my favour. But here the iniquity of arbitration obtrudes itself on the mind of the poor assurer. The wealthy companies, A. and B., by their counsel, asked the arbiters to 'state a case' for the King's Bench. This in both cases was done. Case A. was discussed in the Law Courts for nearly two days before two judges. The judges were evidently impressed with the righteousness

of the arbiters' award. They accordingly, instead of giving judgment, referred the question of 'materiality' to the arbiter, who was a learned K.C., that is to say, he was asked to inquire, whether if the Company A. had known that I was insured with Company B. they would have still accepted me. Lengthy arbitration was again resumed. My bank book and professional accounts were thoroughly overhauled, with the result that the arbiter came to the conclusion that though I had inadvertently not informed Company A. that I was insured with Company B., it was not material, and would not have prevented them from insuring me. The award again in my favour was reported to the King's Bench, but unfortunately for me, not to the two judges who had ordered the reference, but to a single judge who became aware of the case for the first time. He decided against me, on the ground that though I was morally right, I was technically wrong. My counsel strongly advised me to appeal against this decision. This I did, but my appeal was dismissed on the same grounds.

"The arbitration award in the case of Company B., though also in my favour, was set aside in the Law Courts, the judge contending that although I truthfully answered the proposal form questions I had not, according to the policy conditions, disclosed the fact that I was insured with another company.

"In the recent issue of the Encyclopædia Britannica, on the subject of Conditions of Assurance, p. 179, it is stated that, 'an office, in entering on a contract of assurance, does so in the faith that all circumstances material to be known in order to a proper estimate of the risk have been disclosed.

"Accordingly it is made a stipulation, *preliminary to the issue of every policy* (in my case after the issue of the policy) that all the required information bearing upon the risk shall have been truly and fairly stated, and that in case of any misrepresentation or any concealment of *material* facts the assurance shall be forfeited. In practice, however, this forfeiture is rarely insisted on unless there has been an evident intention to deceive. My contention is that in my case the arbitration proceedings fully and substantially established the fact that if any mistakes had been made by me, they were purely inadvertent, and that there was no intention to deceive, and moreover, the arbiters held that any facts inadvertently concealed, though they had been notified to the respective companies, the companies would still have accepted the proposals. But the companies found a loophole purely technical, which is apt to entrap the unwary assurer, and with their wealth, resisted the claim to the last; and deprived me of pecuniary help after a most disastrous accident and costly and anxious litigation proceedings, and were not satisfied with the arbitration awards, which they insist on having, according to their printed conditions."

The following is the official account of the above case on appeal:—

In the King's Bench Division, Mr. Justice Wright heard the case of *Marshall* v. *The Scottish Employers' Liability and General Insurance Company*, a special case raising the question whether the company were liable to pay the plaintiff under a policy of insurance for 500*l*. It appeared that on May 31st, 1900, the plaintiff made a proposal to the company for a policy of insurance against accidents and fever, and in reply to various questions on the proposal form he stated that he was

not now insured and did not propose to insure against accidents or disease with any other office or offices. The agent to whom the proposal was sent went away for his holidays after the receipt of the proposal, and the plaintiff did not hear from the company until June 14th, when he was informed that his proposal had been accepted. Between May 31st and June 14th, however, the plaintiff sent a proposal to the Royal Exchange Company, and effected an insurance with them. In July he met with an accident, which deprived him of the sight of one eye, and when he applied to the defendant company for payment under the policy granted by them they refused to pay on the ground that he had concealed the fact that he was insured with another company. The arbitrator found that when the plaintiff made the declaration that he was insured with no other company he stated that which he believed to be true, and that if the defendant company had known of the second policy it would not have prevented them from accepting the plaintiff's offer.

Mr. Justice Wright, at the conclusion of the arguments, said it was a hard case, but the condition on which the defendant company issued the policy was that the insured should let them know that he was insured with no other company. That, the plaintiff had not done, and, therefore, by the terms of the policy, he forfeited his rights under it. Judgment was entered for the defendant company.

The important points for the reader to bear in mind are: (1) That the plaintiff's good faith was never impugned—he was defeated purely and simply on a technicality; (2) It was determined by the arbitrators and accepted, that his incorrect replies made no material difference in the insurance, that the replies, in other words, were not material to the risks.

An interesting point in insurance was argued in *Jewsbury* v. *The British Natural Premium Life Association* (*Limited*), Birmingham, which came before the Lord Chief Justice (in the King's Bench Division on November 9th, 1904) on further consideration, having been tried by him and a special jury at Birmingham.

Mrs. Mary Agnes Jewsbury sought to recover £1,000 on a policy of insurance on the life of her husband. The policy was taken out on September 30th last year, and Mr. Jewsbury, who was then about sixty years of age, died on November 21st following from blood-poisoning, brought about by an accident which befell him in a Turkish bath. The company refused to pay the insurance, on the ground that Mr. Jewsbury in his declarations to the company and to the medical officer who examined him, incorrectly answered various questions submitted to him. Asked, "Have you ever met with an accident?" he said "No," and further represented that he had not been attended by a medical man during the previous five years, and that he had no local or other disease, personal injury, or infirmity. The jury found that these questions had been correctly answered, though there was evidence that Mr. Jewsbury sprained his thumb in 1901, and was attended by a Dr. Drury for five or six weeks, and hurt his knee in July, 1903—a few weeks before the insurance was effected—by slipping on the pavement, in consequence of which he was under medical treatment for some four weeks.

Mr. Hugo Young, K.C., submitted on behalf of the insurance company that the verdict of the jury was against the weight of evidence.

Mr. Vachell, who appeared for plaintiff, argued that it was for the jury to say whether the questions had been answered correctly or not.

The Lord Chief Justice, in giving judgment, said he was not quite satisfied that he sufficiently clearly directed the jury; he thought the question of materiality was not for them. He thought that on the admitted facts there was no question for the jury. He attached no importance whatever to the fact that death occurred so soon after the policy was taken out. It was not disputed that the statements relied upon were made the basis of the policy, which, on the face of it, said that the statements and declarations made in the application and to the medical officer were part of the contract. The injury to the thumb he did not believe would be considered by any reasonable man to be an accident within the meaning of the policy; but he thought it was different with regard to the second accident, and he came to the conclusion that the incorrectness of the answer was demonstrated by the admitted facts. Therefore judgment must be entered for the defendant company with costs.

Stay of execution as to costs was granted for a fortnight, in view of an appeal.

Special Replies.

It is now a custom practically universal throughout all life offices to have one or more medical officers of their own, before whom either the candidates themselves come, or, if this be not required, then a medical report from an independent medical man is submitted for inspection to a medical officer of the company. By this means a considerable part of the trouble that used to arise has been avoided. Such trouble commonly arose when the companies relied solely upon a report from the medical man who was usually in attendance upon the insurer, which includes one called in *ad hoc* (*Everitt* v. *Desborough*). The ordinary practice now is to refer to this practitioner only when the medical officer of the company thinks it advisable.

In the event of a medical practitioner being called upon to sign a certificate of this kind, the safer course would be that he should decline to do so, except upon a professional consultation with the medical officers appointed by the insurers, after having obtained consent of the assured. If, however, from private considerations, he agrees to sign the certificate, it is his duty to use the greatest caution, not merely in returning answers to the formal question on the paper, but in detailing *all particulars known to him respecting the state of health of the person*. In acting otherwise, he would be doing the greatest possible injury to the representatives of the assured, and probably damage his own reputation. There is no intermediate course: the duty must either be performed carefully, conscientiously, and honourably, or it must be declined altogether. It is a fallacy to suppose that any equivocation or concealment in the declaration can escape detection; and yet, from the evidence which has been given on some trials, it is probable that such an idea had existed in the mind of the medical attendant who attached his name to the certificate.

The actual questions put either to the candidate or to his medical man vary somewhat in different offices, and it would serve no useful purpose to detail them here; suffice it to say that they commonly include searching inquiries into the family history, and into the previous history of the candidate, as well as into the present condition of all his organs.

No one can blame insurance offices for putting these searching inquiries and acting with rigour. Frauds of the worst description have been frequently attempted upon them, and it is only by the adoption of such searching inquiries that they can protect themselves.

In 1893 the medical officers of life insurance companies had become so numerous, and their work so important, that they formed a society known as the "Life Assurance Medical Officers' Association." The association meets from time to time to discuss important points in assurance, and reports of their meetings are to be obtained (*cf.* Sir Dyce Duckworth's Presidential Address, delivered January 27th, 1904).

To discuss fully the various points in the special replies would mean writing a compendium of medicine; the reader is referred to the works by Pollock and Havilland Hall and to the Appendix.

One important point is the use of the term, "*Any other disease or disorder tending to shorten life.*" Upon the meaning of these words

litigation commonly turns, and the opinions of medical experts are required.

It is impossible to lay down any general rules for determining what diseases have and what diseases have not a tendency to shorten life. Any deviation from health might be so interpreted; but the law puts a proper limitation here upon the meaning of the words, considering them to apply to those diseases only which, in a medical view, are regarded as of a serious nature, and, as a general rule, are likely either directly or indirectly to affect the duration of life of any person labouring under them. This question was brought to an issue in the case of *Watson* v. *Mainwaring*, in which payment of the amount of a policy was refused, because the assured had laboured at the time under what was called *organic dyspepsia:* and this fact was kept concealed from the insurers. It was left as a question of fact to the jury, whether the malady with which the deceased was afflicted, and of which he ultimately died, was an ordinary or organic dyspepsia at the time of the insurance. The judge said: "All disorders have more or less a tendency to shorten life, even the most trifling; as, for instance, corns may end in mortification: but that is not the meaning of the clause. If dyspepsia were a disorder tending to shorten life within this exception, the lives of half the members of the profession of the law would be uninsurable." We learn then, from this case, that a person may die from a disease under which he was labouring at the time of insurance; and yet if it be not the common course of that disease to shorten life, the representatives may recover the amount of the policy. This is an equitable interpretation of the terms; for the insurers have no right to give a forced meaning to the words of the policy, and to take advantage of what must be regarded as an accidental result. From other decisions we learn that, in order to render a policy valid, these words do not imply that the assured must have been at the time entirely free from all the seeds of disorder or latent disease. Such a condition is impossible. A man may be labouring under some insidious disease—ulceration of the stomach or intestines, for instance—leading to perforation; but if this be, as it often is, unknown both to himself and his medical adviser, the insurers are bound to take the risk. Lord Mansfield, in the case of Sir James Ross, held that the warranty was sufficiently true if the person were at the time in a reasonably good state of health. A life may be a good life, although the person may be at the time labouring under some latent bodily infirmity.

The editor had personal knowledge of a case in which a young man died from caries of the spine, with psoas abscess, etc., within a year of his insurance. The abscess was present at the time of insurance, but as the candidate was unaware of it and the medical officer did not detect it, the insurance was promptly paid.

On the other hand, a disease tending to shorten life must not be taken to signify only one of those maladies which have commonly a rapid and fatal course—as phthisis and cancer: it may apply to dropsy, gout, asthma, insanity, and many diseases of a chronic character. When the existence of these diseases, or even a well-marked *tendency* to them, is concealed from the insurers, or omitted to be stated through mistake, even without fraudulent intention, the policy in the event of

death, becomes void, because the risk incurred is really different from the risk understood and intended, at the time of the agreement. Such diseases are not necessarily fatal, but this is not the question: their *tendency* is to diminish the expectation of life, and if medical evidence establish this with regard to any disorder intentionally concealed, whether chronic or acute, the alleged contract had no validity.

Material Concealment.—Some medical practitioners entertain the opinion that, provided they can certify that the person is in good health at or about the time of the insurance, this is all that the insurers need know. The same opinion is commonly entertained by the assured; and the latter, after having been attended by one medical man for an illness, will apply to another, a comparative stranger, to certify to his condition of health for insurance. We must not lend ourselves to this system, which is based sometimes upon a mistake, at others upon fraud. If medical men would decline signing the papers under such circumstances, they would not only save themselves from censure, but be actually conferring a benefit upon the applicant, by preventing him from obtaining a policy upon terms which on his death may render it invalid, and entail a forfeiture of the premiums. From what has already been said, it will be understood that the exact state of health of the person at the time of the insurance does not represent the whole of the risks incurred by the office. The restoration to health, as in a case of diseased lungs, may be only temporary: it may be speedily followed by phthisis, and the insurers therefore ought to be informed of the previous condition as well as the present state of the applicant. The conditions in the declarations are so explicit upon this point as to render it scarcely necessary to refer to the propriety of making this addition to the certificate. The disease under which the assured had laboured may have been of a trivial kind, and not likely to affect the risk; nevertheless the safest plan is to state it. The option will then lie with those who are to incur the risk. When facts of this kind are either concealed or not plainly stated, the question of how far they were or were not material to be laid before the insurers is always left to the jury, who are guided in their verdict by their own common sense, as well as by medical opinions. It would appear also, from a decision in the House of Lords in *Anderson* v. *Fitzgerald* (4 H. L. C. 507), that the truth of the answers given, and not their materiality, should govern the verdict of a jury. In a case tried in December, 1856, Lord Campbell held that a suppression of the truth on the part of the person whose life was insured would not avoid the policy, if the party effecting the insurance was innocent and ignorant of the suppression.

No certificate should be signed by a private medical adviser without the definite consent of the would-be assured.

Some medical men have adopted the plan of signing certificates, but have declined to make any written reply to certain queries: as, for instance, the general query—Can you give any and what information respecting the *habits* of the applicant? If nothing be known concerning these, it should be so stated; if, however, the existence of any habits affecting health be known to us, we shall do an injury to the applicant and ourselves by withholding information on the subject. It may be the means of causing a heavier premium to be demanded for

insurance than if the facts were known; and if this should not happen, the omission is very likely to give rise to future litigation. Thus, in the case of the Earl of Mar, the payment of the policy was refused on the ground that the Earl had been addicted to opium-eating. His medical referee replied favourably to the *special* questions in regard to habits, whether sedentary or active, temperate or intemperate; but he neglected to reply to the *general* question regarding habits; and on the Earl's death it was found that he had been an opium-eater for many years before effecting the insurance. This fact might not have been known to the medical referee, but it is always better to fill in the reply either affirmatively or negatively, if the certificate be signed at all, than to leave the office to draw an unfavourable inference, or to render the policy afterwards open to dispute.

The practice of referring to medical men who have been only recently consulted is not infrequent. The opinion of the usual medical adviser might be unfavourable, or he might report on the existence of habits which would render the life uninsurable, or insurable only at a high premium. This want of fair dealing, however, commonly defeats its object. There is expensive litigation, and the policy is pronounced to be void.

Habits.—A person may be labouring under no actual disease at the time of effecting the insurance, but his *habits* may be such as to produce general injury to health, and to have a tendency to shorten life. Concealment of habits, the effect of which on health must or ought to be known to all medical men, must be just as fatal to a policy as the concealment of a serious disease. Although they may not always be included in the questions put by the office, yet the law will hold that the insurers should be made acquainted with all circumstances which might reasonably affect the risk. Concealed habits of drunkenness have thus given rise to medical questions of considerable importance; and in one remarkable instance, which will be mentioned hereafter, a question arose as to whether the practice of opium-eating, which had been concealed from the insurers, had or had not a tendency to shorten life. Some exposures, partly of a civil and partly of a criminal nature, have rendered insurance offices much more strict in their inquiries. In the rules already quoted special information is demanded upon the existence of material circumstances touching health or habits of life, and whether the person is or is not of temperate habits. Any facts bearing upon these questions, if known to the medical adviser, must, of course, be stated. The existence of such habits must be known to the person himself; and the declaration which he signs is so explicit that, if intentionally concealed by him, no individual can reasonably complain of the voidance of the policy and the forfeiture of the premiums.

In a large number of cases the payment of policies is resisted on the ground of concealed **drunkenness and general habits of intemperance.** There is some difficulty in these cases, because medical men may entertain different opinions respecting the effect of such habits upon the general health, and the degree to which they may be safely carried. There is one thing, however, certain—whatever may be our opinion of their effect on health, we are bound to state, if known to us, that they exist, and thus put it out of the power

of a company to dispute a policy upon such a ground. From the frequent concealment of habits of this kind, most offices now adopt the practice of making it a special question, to which a plain negative or affirmative answer should always be given—"Are you now and have you always been of temperate habits of life?" When intemperance is alleged, we find conflicting medical evidence. It becomes a question—What is intemperance? and this is answered according to the views of a witness.

This question was raised in *Wigans* v. *Gresham Life Assur. Soc.* (Bristol Sum. Ass., 1872) and decided in favour of the company. There was proof of intemperate habits at the time the insurance was effected, and there was also evidence that the deceased had suffered from diseased lungs. These facts were suppressed by the person assured (see also *Thomson* v. *Weems*, 9 A. C. 671).

The real question, however, divested of its sophistry, is this:—Can any person indulge in an excessive use of alcoholic liquids without this practice sooner or later leading to an impairment of health, by producing disorder of the stomach and liver, and remotely affecting different organs? The effects of such habits may not show themselves immediately, but the office requires to be informed of their existence or non-existence, and not of the period when they are likely to affect health visibly or to engender a fatal disease. To assert that a man can be addicted to excessive drinking without impairing his health is contrary to experience. Habit may accustom a man to intemperance—it may enable him to drink a large quantity of alcoholic liquid without being apparently injuriously influenced by it at the time; but a deranged state of system will sooner or later follow, and *delirium tremens* or cirrhotic liver, with its attendant risks, will probably supervene. A good natural constitution may enable a man to resist the pernicious effects for a certain period, but ultimately they will show themselves in some form of disease. It is unfortunate that no light is permitted to be thrown on such cases by pathology. *Ballantine* v. *The Empl. Ass. Co.* (31 Sc. L. R. 230) brought out the principle that a post-mortem examination of the assured cannot be demanded with success, unless the personal representatives of the deceased are agreeable. Post-mortem examinations are not always made in these cases; for the death being, as it is called, natural, it is not commonly thought necessary to inspect the body, although the condition of the liver and other organs might at once remove a difficulty which might arise from conflicting evidence on the habits of the deceased.

In all cases of a contested policy, one important principle is uniformly acted upon; those who resist the payment are bound to prove what they allege by conclusive and satisfactory evidence. A court will not receive probability or conjecture—the evidence must be certain. Hence many suits fail from the medical evidence going no further than to show that a particular disease or habit had *probably* existed at the time of insurance. If the disease or habits be shown to have *certainly* existed, the evidence may still fail to prove satisfactorily that the concealment was either wilful or material.

Contested cases of life insurance often show the imperfect manner in which medical observations respecting health or disease are made, and that the medical treatment of persons whose lives are insured may become a material question in the event of a policy being disputed.

There is another habit, the concealment of which gave rise to an important trial: the practice of **opium-eating.**

The Earl of Mar effected an insurance on his life, and two years afterwards, *i.e.* in 1828, he died of jaundice and dropsy at the age of fifty-seven. The insurance company declined paying the amount of the policy, on the ground that the Earl was, at the time of the insurance, and had been for some time previously, an opium-eater. This practice was concealed from the insurers; and it was further alleged that it had a tendency to shorten life.

Christison, Alison, Abercrombie, and Duncan were examined on the part of the insurers; and although they entertained the opinion that the habit had a tendency to shorten life, they were unable to adduce any facts or cases in support of it. Their opinion was based not on personal experience, but on the general effects of opium, as manifested by its action on the brain—by its producing disorder of the digestive organs, and giving to the person a worn and emaciated appearance. In most of the instances collected, there was no evidence that life had been shortened by the practice. On the contrary, some of the persons had carried it on for years, and had attained a good old age. The jury returned a verdict for the plaintiffs, not on the ground that the practice was innoxious and its concealment immaterial, so much as on the technical point that the insurers had not made the usual and careful inquiries into the habits of the deceased; and they were therefore considered as having taken upon themselves the risk from their own *laches*. It appears that the general question with respect to habits was not answered by the medical referee, and it was therefore considered that the office had waived the knowledge of them. A new trial was granted, on the ground of misdirection, but the suit was compromised.

On the whole, we are bound to conclude that the habit of opium-eating is, as a rule, injurious to health, and is therefore calculated to shorten life. In any proposal for life insurance, the insurers should be informed of this habit where it exists, and no medical man should sanction its concealment, merely because many persons addicted to it have lived for years in apparently tolerable health. One of the questions put to a medical man is, whether he knows any material circumstance touching the health or habits of the person to which the other inquiries in the certificate do not extend; and if so, he is required to state them. Now, without going the length of saying that the life of an opium-eater is uninsurable upon a common risk, the habit is itself sufficiently material to require that it should be declared in reply to such a question as this. The practice may be, and often is, concealed from a medical adviser; then the assured, if not candid in avowing its existence, must expose his representatives to the risk of losing all benefit under a policy. Independently of medical facts, which appear to favour both sides of this question, a jury would probably be guided to a verdict by the effect actually produced on the constitution of a person who has been addicted to the practice. If it has continued many years, and there is no proof of his health having in consequence undergone any remarkable change, this might be regarded by the jury as the best possible evidence in favour of the concealment not being in such a case material. The insurers could not equitably complain of the verdict in the Earl of Mar's case; for as he began

opium-eating at twenty-seven, and died at fifty-seven without any obviously injurious effects being produced by the use of the drug, it could not be said that in this case at least the practice had shortened life. It is rarely in our power to apply any better or more practical test than this, under circumstances in which medical facts appear to bear both ways. The case is very different from intemperance in the use of alcoholic liquids: no one can doubt that in this form the results must be inevitably to impair health and to shorten life. The facts here bear one way; and if instances of longevity can be adduced among spirit-drinkers, they are well known and generally admitted to be exceptions to the rule. The queries put by insurance offices are now so explicit, that they must be considered as including the habit of opium-eating; and there does not appear to be any just pretence for evading the admission of the practice, either on the part of the assured or (if known to him) of his medical adviser.

Dr. Taylor's original remarks are here so much to the point that the editor leaves them untouched. The Parliamentary Committee that collected evidence at the close of the nineteenth century on the subject in reference to the importation of opium into India came to no definite conclusion which could be used as showing any fixed rule applicable to all cases; but the evidence showed very conclusively indeed that he who conceals from an insurance company the habit of opium-taking must run the very greatest risk of losing premiums and insurance.

The following case is reported to the editor by Dr. Hale White, thus:—

> Sir Thomas Stevenson and I were once associated in a big insurance case. The man insured for 30,000*l.* and died within two months. Morphia detected in the stomach. The insurance company said they did not pay for suicide; but they had to pay because it was shown that the man was an habitual morphia-taker, which they did not know when they effected the insurance.

In December, 1862, a case was tried in which it was alleged that there had been concealment of the existence of **gout** (*Exors. of Fowkes* v. *Manchester and Lond. Assur. Com.*). The deceased Fowkes, a commercial traveller aged forty-nine, in the year 1860 effected a policy on his life for 1,000*l.* He died in June, 1861. Payment was refused on the ground that the answers of the deceased were untrue, and that there had been suppression of a material fact. It seems he was asked whether he had ever been *afflicted with gout*, and he answered "No." He was asked whether the life had been offered at any other office, and, if so, whether it was accepted; and he answered that it had been proposed, and had been accepted at an ordinary rate. These were the answers which it was alleged were false. On the part of the company a surgeon stated that in May, 1858, the deceased was suffering from suppressed gout. He had an "extremely slight attack," which lasted only about forty-eight hours; he did not tell the deceased that it was gout; he believed that he died of suppressed gout in an aggravated form. A proposal of the deceased to another company, which had been declined, was put in evidence. On the part of the plaintiffs it was contended that there was no evidence that the deceased had ever been "afflicted with gout." The L. Ch. Justice left it to the jury—first, whether the answers of the assured were untrue; and next, whether they were false to his knowledge. First, had he been "afflicted with

gout"? The question must be considered with some reasonable latitude, and it was not because a person had some passing symptoms which a far-seeing medical man might ascribe to the presence of suppressed gout in the system, but whether there was gout in a sensible, appreciable form. This certainly was stated, before the proposal, to have been "the slightest possible case" of gout, according to the medical evidence. As to the other question—whether the life had been proposed at any office and accepted or declined—it appeared that the life had been proposed at two offices, and accepted by one but declined by the other. Had the assured answered truly in simply saying that he had proposed and been accepted? The question no doubt was not in the most comprehensive form, but was it answered fully and fairly, and according to its obvious meaning and effect, by saying nothing of the proposal which had been declined. He thought not, but left it to the jury. He, however, thought further that it was not strictly true that the life had been "accepted" in the sense in which the word was used—for it had not been accepted by any office on a proposal for assurance, but merely approved by the medical man. It was for the jury to say whether either of these answers were untrue, and, if so, whether either was untrue to the knowledge of the assured. The jury found that the assured had not been afflicted with gout at the time of the proposal; also that the answer to the other question was untrue, but not to his knowledge. The L. Ch. Justice directed a verdict for the plaintiffs, subject to a point reserved for the court whether the knowledge of the untruth was material.

A case involving certain questions in **obstetric practice** (laceration of the perineum) came before the Court of Exch. in February, 1873 (*Brembridge* v. *Hoare*).

Tho action was by Brembridge, executor to a Mrs. Formby, against the Sun Life Insurance Company, to recover the amount of a policy on the life of tho testatrix. This was resisted by the company on the ground of material concealment. At the date of tho policy Mrs. Formby was a widow, æt. 28. Her husband was a man of intemperate habits and believed to be affected with syphilis. Sho was twice confined—in March, 1867, and April, 1870; and, as it afterwards appeared, on both occasions instruments were used, and on one craniotomy was performed. In November, 1870, she proposed to insure her life in favour of a physician (Lylo), whom she subsequently married. She filled up the usual certificates, stating that her health was good, and that she had had no illness requiring the aid of a medical man except in her confinements and for passing ailments. She referred to Kempe, who died soon afterwards. Kempe stated in his certificate that he had attended her in two severe confinements, from which she made quick recovery, and once or twice for slight stomach derangements. The company wrote to Kempe for further information respecting the confinements, and he answered by saying that Mrs. Formby's labours were prolonged in consequence of a somewhat contracted polvis and unusually large children, and he saw no risk in any future confinements more than ordinary. Budd, the company's medical officer, saw the lady, asked the usual questions, and all being satisfactory, recommended her as a good life. The life was, therefore, accepted on December 3rd, 1870.

The premiums were paid during the year 1871, and in March, 1872, notice was sent to tho company of her death, with a certificate from Tyler Smith stating that she had died on February 1st of an internal abscess, ho having attended her for six or seven months. This certificate naturally suggested to the office some disease of the sexual organs, especially in connection with the histery of the instrumental deliveries. Tyler Smith was therefore written to by the actuary for further explanation, and he replied by stating that the late Mrs. Formby consulted him in August for leucorrhœa, or the "whites," and that the inflammation, which resulted in abscess and so caused her death, arose from her sitting out of bed on a cold night

in January without a fire, while menstruation was going on. The abscess formed around the womb, but no post-mortem was made. The managers still considered the certificate of death unsatisfactory, not being able to understand why the lady had come to London to put herself under the care of a medical man five or six months for the "whites," and had then unfortunately died suddenly of an abscess. After some hesitation they felt they could gain no better information than from her medical adviser, and agreed to pay the amount of the policy. Shortly afterwards it was reported to the company that Mrs. Formby was in bad health at the time of the insurance, and that she had undergone an operation. Inquiries were made, and it was found that in August, 1871, she had suffered from prolapse and irritable ulceration of the uterus, and further, the root of the whole matter was that the perineum had been torn in one of her confinements. An operation was performed to restore the perineum: the wound healed: she had a relapse, followed by rigors, an abscess formed, and this broke into the rectum. About the time of her insurance and previously, she had been under the care of Willis; and Lyle (her husband) had prescribed for her tonics and astringent lotions. It was not alleged by the company that Lyle knew of the lacerated perineum, or that his wife knew exactly the cause of her suffering. There was some evidence to show that she had had syphilis, as there was mention made of a rash, ulcerated throat, and the fears of the lady herself respecting that disease. The managers of the company could not acquit Mrs. Formby of untruthfulness in stating she was in good health when, if she had said as much about her health as was contained in her private letters, and had spoken of a chronic uterine discharge, her life would not have been taken, and her actual condition never known. On these grounds the office refused to pay the claim.

The nurse who attended Mrs. Formby at her last confinement spoke to the laceration, and that she had attended to it. Another witness deposed to Mrs. Formby looking very ill in the summer of 1870, and complaining of weakness ever since her confinement, and she did not know that she would ever be well again; she had hysterics and a constant discharge. This evidence was confirmed by that of others. It appeared that after her last confinement she had always complained of langour and general debility, that she was generally out of health, and especially had difficulty in walking and standing. No explanation was offered as to Kempe's silence respecting the laceration, but it was supposed that he might have forgotten the circumstance, or thought that it had healed. The two persons who had acted as referees confessed to knowing very little of the assured. Barclay, Risdon Bennett, Birkett, and Wood were examined as expert witnesses, giving it as their opinion that the laceration, falling of the womb, and attendant discharges would probably have been attended by the symptoms which Mrs. Formby spoke of in her letters, and which she ought to have revealed to the office. They believed that death was caused by the bursting of an abscess into the peritoneum, or from pyæmia; the latter, they said, was not common after such an operation as had been undergone, but might occur after the slightest wound. From the description of these witnesses Mrs. Formby appeared to be a dark woman, stout, and good-looking, at first sight presenting the appearance of health; but some witnesses said she was fat and flabby, of sedentary habits, soon tired on exertion, nervous and excitable, but that she ate and drank well.

The case for the plaintiff was that the assured was substantially in good health; that the laceration was of the most trifling character, gave her no inconvenience, and was unknown to her; that the discharges were simply leucorrhœal; that the ailments voluntarily spoken of by her in the letters to her friends denoted merely a temperament very commonly found in women, in which a pleasure is found in detailing all their feelings and little ailments. That the laceration was slight; that there was no need of the operation, which was done at Mrs. Formby's request when she understood its nature; that she perfectly recovered from it, and was about to leave Tyler Smith's care when an abscess appeared, totally unconnected with the operation, which speedily carried her off. Witnesses were called who spoke generally as to her good health; but great discrepancies existed as to her walking powers, some saying she walked well, and others, on cross-examination, that she walked slowly, and was very soon fatigued.

West only saw her once, and did not thoroughly examine her. Graily Hewitt spoke of the laceration as slight, but that she had anteversion of the uterus with some enlargement, and ordered her a cradle pessary. She remained under his care some weeks. The witness knew nothing of the ulceration and purulent discharge,

but the patient was very much out of health. Tyler Smith said he found Mrs. Formby suffering from purulent discharge, prolapsus, and ulceration of the womb. He removed a pessary, and admitted that this might have had something to do with the ulceration and discharge. He found also a laceration of the perincum. (Various accounts were given of this laceration. It did not pass through the sphincter ani, but reached to within about a quarter of an inch of it.) By medicines and injections he cured the discharge and ulceration, and then proposed the operation for restoring the perineum. This was performed at the end of the year 1870. The wound soon healed, and at the end of three weeks Mrs. Formby came down into the drawing-room to dinner. In a day or too, however, she became very ill, had rigors, and took to her bed. In the course of a week or two it was found that an inflammatory process was going on among the pelvic organs, and, finally, an abscess was felt which burst into the rectum. Again a collection of matter was formed, which Tyler Smith believed burst into the peritoneum, as she one day suddenly became worse with symptoms which denoted such an occurrence. Death took place about two months after the operation. He asserted again most positively that Mrs. Formby had recovered from the operation, and that he was about to send her to Seaford; that she got out of bed one night during a menstrual period, took cold, and this was the origin of the abscess. He therefore had no need to mention the operation in the certificate of death.

Bramwell, B., summed up, reviewing the whole of the evidence with great care, and finally left three questions to the jury: 1. Was there any misrepresentation? 2. Was there any material misrepresentation? 3. If any, was the policy procured by it? The jury returned affirmative answers to all three of these questions, and a verdict was accordingly found for the defendants (*Lancet*, 1873, 1, p. 252). It will be perceived that in this case, from the verdict of the jury, there had been material concealment in reference to the existence of lacerated perincum since the last confinement.

Such a case could hardly give rise to litigation now that suppurative disease of the female pelvic organs is so much better understood; there can be no question but that there was very material concealment, though perhaps not intentional.

Diseases affecting the **urinary organs** have generally a tendency to shorten life. This is especially the case when these diseases have a chronic character and occur in persons advanced in life.

A case of this kind (*Leete* v. *Gresham Life Assur. Soc.*) was tried in the Court of Exch., July, 1851. It was an action to recover on a policy on the life of one Giles Clement. The defendants pleaded misrepresentation and concealment of facts as to the real state of the health of the deceased. It was proved by a number of medical and other witnesses that the deceased had been subject from boyhood to enlargement of the prostate gland and prostatic disease. This state of the urinary organs was concealed from the knowledge of the company at the time the policy was issued, and it was contended that it was material to the risk. Rees and other physicians gave evidence to the effect that the disease had a tendency to shorten life. The defence was that it had not a tendency to shorten life, because men of the most advanced ago were found to be affected with enlargement of the prostate gland, and yet they lived on. This statement was not supported by any medical evidence, and the jury returned a verdict for the defendants, considering that the concealment was material to the insurers.

In the *Lancet*, 2, 1902, p. 867, will be found a critical analysis of 500 insured deaths in reference to antecedent **syphilis** by Dr. F. Parkes Weber, to which the reader is referred.

INSURABLE INTEREST.

It is supposed that a man has a direct interest in insuring and preserving his own life, but the insurance of the lives of others has

been considered objectionable, on the ground that it tends to create an interest in the death of a person, and thus to lead to secret acts of murder. The 14 Geo. III. c. 48, expressly enacts that no insurance on a life shall be valid unless the person insuring has a direct legitimate interest in the person whose life is insured. The statute was enacted for the purpose of preventing gambling in policies, and to guard society against the risk of persons insuring, and then contriving the death of the assured for the sake of the payments to be made under the policy. Its effect is simply to render the policy void; it does not require that the premiums shall be refunded, nor does it award any penalty to the offenders. As policies of life insurance may be bought and sold like other property, they may fall into the hands of persons who have no other interest in them than the desire that such policies should speedily become claims by the death of the assured. The interest of such holders, it has been justly observed, lies in the *death* and not in the *life* of the insured.

Hebdon v. *West* (32 L. J. Q. B. 85, 1863), *Wainwright* v. *Bland* (5 L. J. Ex. 147, 1836), *Reg.* v. *Palmer* (1856), to be found in former editions, are cases in point where large sums were involved. The case of Dr. De la Pommerais, in Paris, in 1864, is another case in point.

The proper method to stop this secret system of murder would be by placing legal restrictions on the sale or assignment of policies, and by preventing the purchase of them by strangers, who can only have an interest in the death of the assured at the earliest possible period. Further, no person insuring the life of another should be permitted to claim after death a larger sum than would represent his lawful recoverable interest in the life of the assured. The burial-club murders are said to have been much checked by a regulation of this kind, which prohibited a person from recovering under this species of insurance, more than the amount proved to have been actually paid for the funeral. It would be well if this principle were universally carried out, but from the evidence given at the trial of Mary Ann Cotton (*Reg.* v. *Cotton*, Durham Lent Ass., 1873), there is reason to believe that insurances on lives are secretly effected simply for the purposes of murder. The prisoner was indicted for the murder by poison of her stepson, who died in 1872. The body of the deceased was exhumed, and arsenic was detected in it. This was proved to be the sole cause of death. This woman, it was stated upon well-ascertained facts, had at different times killed by poison her mother, fifteen children, three husbands, and a lodger—making altogether twenty persons in a few years; and the lives of most, if not all, of them were insured. In some of these cases she had claimed and received from the insurance offices the premiums on these deaths. One of her three husbands thus disposed of, and four of her children, were insured in the British and Prudential Insurance Office. They died rather rapidly one after the other, and the medical man assigned *gastric fever* as the cause of death, when the symptoms were not consistent with this disease. The prisoner obtained from the office a sum of thirty-five pounds by the death of this husband, and some smaller amounts from burial clubs by the death of the children. She then married a man with a family of children, and was very anxious to have his life and the lives of his children insured. One

day he found her at an office trying to procure an insurance on his life. He then refused to live with her, and his life was thereby saved. This woman was convicted. It is clear from the evidence in this and other cases, that some of the insurance offices which find clients among the poor, furnish great facilities for such murders, and that the managers are not sufficiently careful in making inquiry into the means, motives, and objects which induce persons in this class of life to effect insurances on the lives of others (see also *Cleaver* v. *Mut. Res. Fund*, 1892, 1 Q. B. 147).

The trial and conviction of this criminal for these insurance murders brought to light another fact, namely, the great insecurity of life in this country owing to the perfunctory manner in which some medical men discharge an important duty in filling up certificates of the causes of death (*vide* p. 239 and *supra*, p. 926). With fully marked symptoms of arsenical poisoning, these sudden and violent deaths were registered, one after the other, as *gastric fever*. The success of this criminal depended, first, on the facilities for insuring the lives of others in a low class of insurance offices, and secondly, on the carelessness with which the causes of death were certified.

The more recent case of *Flannigan* v. *Higgins*, and the Deptford arsenical poisoning cases of 1889, show the reckless extent to which these insurance murders are carried.

In February, 1904, an interesting decision was given in the Court of Appeal, illustrating the position of persons who have paid premiums upon policies upon the lives of their relatives, under the belief that the relationship gives them an insurable interest sufficient to make the policy valid.

The plaintiff, a Mr. Pearse, had insured the life of his mother, through an agent of the defendants, the Pearl Life Assurance Company, Limited. At the time the policy was taken out the agent told Mr. Pearse, quite in good faith, that the policy was a good one in law. Having paid the premiums upon the policy for some years, plaintiff now sought to recover them, upon the ground that the policy was void under the Life Assurance Act, 1774, as he had no insurable interest in his mother's life, and that the statement of the agent that the policy was a good legal policy was a misrepresentation of fact with regard to the plaintiff's insurable interest.

Upon behalf of the insurance company, it was contended that, even if the plaintiff had no insurable interest, the premiums paid by him could not be recovered, as the statement of the agent was merely that the defendants always paid on these policies. Further, that, even if the agent made a statement that the policy was good in law, it was an innocent misrepresentation as to the law, and the premiums therefore could not be recovered.

The court held that, assuming, without deciding, that the plaintiff had no insurable interest in his mother's life, the representation of the agent was a mere innocent misrepresentation as to the law; that unless there is some fraud, duress, or oppression, or some fiduciary relationship between the parties, a party to an illegal contract who has sustained a loss in consequence of a mistake in law must submit to that loss; and that the plaintiff had therefore failed to make out his case, and could not recover the premiums (see also *Halford* v. *Kymer*, 1830, 10 B. & C. 724).

The insurance of the lives of children is still too prevalent, *vide* Bristol Assizes, February, 1904, where a case of 'attempted murder of an insured child' was tried.

In August, 1904, an inquest was held at St. Helens on a girl, æt. 13, whose life had been insured in 1901 by the woman in whose care she had been left. The sum of over 20*l.* was received by this woman on the death of the child. The child was buried, but suspicion was aroused that the death was not a natural one, and exhumation was ordered. Analysis proved that death was due to arsenical poisoning. The woman was committed for trial (*vide R.* v. *Burndred*).

SUB-SECTION B.—ACCIDENT INSURANCE.

THE WORKMEN'S COMPENSATION ACT.

There are now several offices which insure persons against accidents occurring on sea or land, and the Workmen's Compensation Acts (1897-1900) are, from a medico-legal point of view, merely a compulsory (on the master's part) accidental insurance ; and it would seem at first sight that in these cases there would be less room for litigation. The proof of the accident and the amount of injury done or (if fatal) the cause of death, would appear to be a simple matter. But the question arises : What is an *accidental* as distinguished from a *natural* cause of death ? In other words, what is understood by an " accident " ? With our ideas of an accident, we generally associate physical injury or violence done to the person ; and if a man dies from any other cause his death cannot be said to be accidental. Lexicographers describe an " accident " as " the happening of an event without the design of the agent," or " an event that takes place without one's foresight or expectation ; " but neither of these definitions would exclude diseases of a fatal kind. Tardieu is correct in stating that, in a medical sense, an accident is characterised by its effects on the body—it signifies injuries more or less severe such as are produced by blows, falls, the agency of poisons, death by asphyxia or by a violent death, often sudden and always more or less rapid.

Such was Dr. Taylor's opinion some fifty years ago. The editor's view of it now is that there is no other cause in the world that gives rise to so much medico-legal work and differences of opinion amongst medical men as this insurance against accidents. The principal reason for this is that practically all accident insurance policies have clauses for weekly compensation during total and partial disablement, questions which have to be decided almost entirely upon medical grounds. It is not only insurance companies that thus cause litigation with medical evidence, but any one may also be a defendant in an action for damages caused by the alleged negligence of themselves or their servants, actions in which medical evidence as to the amount of injury done and disablement caused becomes of vital importance to the case. The matter must, therefore, be fully considered. A series of decided cases is compiled in " Definitions of Accident and Accidental," by S. B. Atkinson (" Trans. Med. Leg. Soc.," vol. 2).

WHAT IS AN ACCIDENT ?

Dr. Taylor's ideas enunciated above as to what is an accident, would seem to correspond sufficiently to common sense, and prior to the Workmen's Compensation Act, 1897, these ideas seem to have

given rise to no dispute; when, however, that Act came into force the position was immediately altered.

Clause 1 of the Act (60 & 61 Vict. c. 37) runs as follows:—

> If in any employment to which this Act applies *personal injury by accident* arising out of and in the course of the employment is caused to a workman, his employer shall . . . be liable to pay compensation. . . .

The working man, aided by legal advice, soon began to try to extend the ideas of Dr. Taylor so as to include certain events in pathology, in the term "personal injury by accident" within the meaning of the Act, events which may be described as the culminating point of a pathological process, a point reached by the strain of exertion in heavy work. Blood-spitting from ruptured vessels in the lungs, rupture of an aneurysm, hernia, rupture of an aortic valve, anthrax inoculation, detached retina, are illustrations of the position, and doubtless others may arise from time to time.

In January, 1903, before Judge Greenwell, in the Newcastle-on-Tyne County Court, an attempt was made to call a rupture of an aortic valve an accident. Judge Greenwell decided against the claim on the ground that no *external* fortuitous or unforeseen circumstance had arisen (*B. M. J.*, 1, 1903, p. 37).

Dr. Benthall, writing in the *Lancet*, 2, 1900, p. 480, gives the following list of cases, tried in county courts mostly, involving liability under the Act, though he does not give full references to the cases themselves.

Gout.—(*Lloyd* v. *Sugg & Co.*, Court of Appeal, December 2nd, 1899, before A. L. Smith, Collins and Vaughan Williams, LL.JJ.) A workman in the course of his employment held a flatter for a hammerman to strike. The flatter turned and his hand was jarred. Two days afterwards gout appeared in the hand and his medical attendant stated that the man had the gouty diathesis and had had several previous attacks of gout in this same hand. The Court of Appeal held that the employer was liable, Lord Justice Collins going out of his way to explain that under this Act employers were liable just in the same way as railway companies were, where negligence was proved—that is, that they have to pay heavily for a slight injury to a weakly person when the same injury would not, perhaps, have affected a healthy one (2 W. C. C. 5).

Bright's Disease.—A bruise on the shin producing in a workman suffering from albuminuria prolonged ulceration was held to render the employer liable.

Electric Shock.—A workman engaged as a bricklayer alleged that by touching a broken incandescent electric light he had sustained a shock that produced permanent disability. The hospital surgeons stated that they had not heard of any accident, but had treated the man for peripheral neuritis of alcoholic origin. The man was a typical chronic, alcoholic and it was explained by medical and electrical experts that 100-ampère current could not cause the disability. The county court judge remarked, "Oh, but they kill people by electricity"; and he could not be made to see the difference between 100-ampère current working at a pressure of under 100 volts and of a current at a voltage of 3,000. He was asked to feel the current of an identical lamp to the one in question, but he declined and awarded the workman 1*l.* a week for life.

Cancer.—A workman suffering from cancer of the bladder, for which an operation had been performed, died after a further operation in the groin. Although cancer was the cause of death it was alleged that the man had accidentally wrenched his leg at a time between the two operations, and a "fatal" claim was made on the employer.

Varicose Veins.—A workman with varicose veins of long standing in both legs had an accident producing a slight sprain of one ankle. When all objective signs of this sprain had disappeared he said that he could not work as his veins were much worse. Although two medical men who had watched the case all through

refuted this, and although the workman did not produce any medical evidence in support of his statement, the county court judge awarded him half wages for life.

Employers have also been held to be liable in cases of phthisis where an alleged strain had been said to produce hæmorrhage; in cases of diabetes when gangrene had appeared after a trivial injury, and in cases of old age when senile gangrene had appeared after a bruise of a foot. Numberless cases have also occurred where county court judges have disregarded the medical evidence altogether and have made awards in favour of workmen who were absolutely not in any way disabled (*vide* also Benthall in the *Lancet*, 2, 1899, p. 903).

In 1903 the House of Lords unanimously decided that a **hernia** coming on as the result of excessive straining was an accident within the meaning of the Act. In delivering judgment Lord Macnaghten swept aside any idea of "fortuitous occurrence from without" as being essential (*Fenton* v. *Thorley & Co.*, *vide B. M. J.*, December 5th, 1903, p. 1482).

In Scotland, Lord McLaren has decided that an internal physiological injury should be included.

The following is taken from the *Lancet*, 1, 1900, p. 1253: "At the Pontypridd County Court held recently before His Honour Judge Gwilym Williams, a collier who had worked at the Great Western Colliery for fifty-two years claimed eight shillings per week from the company, being half the wages he earned before the accident in September last. Medical evidence showed that the plaintiff was now suffering from **rheumatism** in the shoulder-joints and not from the effects of the accident, but that there might be slight traces of the accident left. His Honour said that such cases were very difficult to decide, as he had to depend absolutely on the medical evidence, and medical evidence could not always define with sufficient accuracy the extent to which an applicant was incapacitated. Eventually judgment was given for five shillings a week."

In the Court of Appeal, December 17th, 1903, before the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, two cases of infection by **anthrax** were argued as appeals from Bradford and Kidderminster County Courts respectively. The cases are thus reported:—

Mr. J. J. Wright, who appeared for the appellant in the first case, said the question was whether the workman, Martin Higgins, had sustained personal injury "by accident" arising out of his employment, within the meaning of the Act. The respondents, Campbell and Harrison, Limited, had a large wool-combing factory at Bradford, at which the appellant worked, and in the course of his employment he had to handle some piles of Persian wool, which proved to be infected with anthrax. He was taken ill and found to be suffering from that disease, the bacillus from the infected wool having entered his system through a pimple, the head of which had been knocked off by the man's shirt collar. The man had since recovered. No question arose as to the amount of compensation, that having been agreed to between the parties, the only question being whether the injury was caused by "accident," in which case the Act rendered the masters liable, or arose from disease. The learned judge took the latter view, and refused to award compensation. The learned counsel submitted the learned judge was wrong, and that the man had met with injury by accident. It had been held that a scratch producing blood-poisoning was an "accident," and it could make no difference that the poisoning was caused by the inhalation of a microbe or bacillus inoculation. It differed entirely from "phossy jaw" in the match trade, where workpeople knew of the risk they were running. In this case the injury arose from an unforeseen and unexpected cause, and, consequently, came within the popular and ordinary meaning of the word "accident."

Mr. S. T. Evans, K.C., for the respondents, submitted that it was a case of disease, and, therefore, not an accident within the meaning of the Act. The first symptom of the disease was a malignant pimple. It was often met with in this

class of work, and was known as the wool-combers' disease. It was one of the incidental risks which a wool-comber was fully aware he must run.

In the second case the facts were precisely analogous, except that the workman (Turvey) had no abrasion of the skin, and died from the complaint contracted. In his case, the county court judge held that the contracting of the disease was an accident, and that the employers, Messrs. Brintons, Limited, of Kidderminster, were liable.

Mr. Rnegg, K.C., having argued the appeal for Messrs. Brintons, Limited,

The Master of the Rolls, in giving judgment, said the court had to deal with these cases with the authority of the ruling of the House of Lords before them. In his opinion, both cases fell within the principle laid down by the House of Lords, and the definition of the word "accident" given by Lord Macnaghten. That noble and learned lord had defined the word as "a mishap or untoward event not expected or designed." No doubt, the words in the Act, "arising out of the employment," excluded many forms of sickness or contagion. But here the employment was the direct cause of the workman receiving the infection. These cases, therefore, both came within the Act, and, therefore, the judgment given in the first case must be reversed and that in the second case affirmed.

Mr. Rnegg asked for a stay in order to carry the Kidderminster case to the House of Lords.

The application was granted on the condition that the widow should be paid fifteen shillings a week until the appeal was heard, and the money paid not to be returned if the appeal succeeded.

Thus deciding that infection with anthrax is an accident within the meaning of the Act.

The same Court of Appeal also decided that during the dinner hour a workman is still "employed" within the meaning of the Act.

In 1904 a very interesting case came to arbitration to decide the following point: "Is Malta fever **'septicæmia'** within the meaning of the accident policy?" The facts were as follows:—

A bacteriologist insured himself against "septicæmia" (with the words "blood-poisoning" in brackets after the word septicæmia). He inoculated himself accidentally with Malta fever. On his claiming under his policy the Scottish Accident Co. refused to pay, and the matter was brought before an arbitrator (Mr. Longstaff, a barrister). A considerable amount of evidence of a strictly scientific character was given by the most eminent bacteriologists in London to shew that Malta fever exactly corresponded with the scientific definition of septicæmia. The company called no witnesses to defend the case, notwithstanding which the arbitrator decided against the claimant. It is the rule for arbitrators to abstain from giving reasons for their decisions.

The case, being a type of considerable importance, is recorded in full in the *Lancet*, 1, 1904, p. 1811.

The point to the editor seems to have lain in this: That septicæmia in its strict definition, "a disease due to micro-organisms which can, and do, as organisms, invade the whole body," must be held to include two classes or genera of diseases—viz., (*a*) Diseases which have individually had attached to them a specific name, *e.g.*, Malta fever, typhoid fever, malarial fever, etc.; and (*b*) diseases to which only a generic term of septicæmia has been applied due to microbes spoken of as septic. The arbitrator must have taken it only to include the latter case, a decision which is clearly wrong if scientific names are to have any definite meaning attached to them.

Is Sunstroke an Accident?—This question came before the Queen's Bench in *Sinclair* v. *The Maritime Insur. Co.* (1861, 30 L. J. Q. B. 77). The action was brought by the administratrix of a person named Laurence, who, being about to proceed on a voyage as a

master of a vessel, insured himself against any personal injury from any "accident" which might happen to him upon any ocean, sea, river, or lake. The assured being with his ship in the Cochin river, on the south-west of India, and being on duty on board his ship, was, in the language of the special case, "struck down by sunstroke," from the effects of which he died in the course of the same day. The question was, whether the death arose from "accident" within the meaning of the policy, and the opinion of the court was that it did not. It was difficult to draw a line between a death from "accident" in a policy of this nature and a death from natural causes such as should be of universal application. But the court might safely assume that in an "accident" some violence, casualty, or *vis major* was necessarily involved, and that a death from a known natural cause could not be considered as accidental. Disease or death engendered by exposure to heat, cold, damp, and the vicissitudes of climate, or atmospheric influences (*malaria* being instanced), could not properly be said to be accidental; at all events, not unless the exposure was brought about by circumstances of an accidental character. Thus, if a mariner in the ordinary discharge of his duty caught cold and died, his death would not be accidental, though it might be so if by reason of shipwreck he was compelled to take to the boat, and died from exposure to wet and cold. In one sense the death was accidental, for the effect was uncertain beforehand; but it must be considered as the effect of natural causes, and not accidental. Sunstroke, so far as the court was informed of it, was an inflammatory disease of the brain, brought on by exposure to the intense heat of the sun's rays. To that disease persons exposing themselves to the sun in tropical climates were more or less liable, just as persons exposing themselves to natural causes of a different kind were liable to disease consequent therefrom. Death from "sunstroke" must therefore be considered as arising from natural causes and not from accident, and judgment was given in favour of the defendants.

Lightning.—In the case of a person being killed by lightning whose life was insured against accidental death, the question has arisen whether such a mode of death was accidental or not. Death by lightning is certainly not a natural cause of death, and in common language any person killed by lightning is said to have died accidentally.

Rather a curious question as to compensation for the death of a labourer by lightning came before Judge Bradbury on November 12th. Two bricklayers were at work on a scaffold on new premises at Failsworth and were both killed. The widow of one claimed compensation under the Workmen's Compensation Act and, subject to the question of liability, the amount was agreed on as 300*l*. At a former sitting of the court "a doubt arose whether the fact that the deceased man was working on a scaffold twenty-three feet from the ground made an appreciable increase in the risk of his employment as compared with working on the ground," and the case was adjourned for expert evidence. On the 12th Dr. C. C. Garrard, head of the testing and experimenting department at Messrs. S. Z. de Ferranti and Company's electrical engineering works, and Mr. J. M. Faulkner, an erector of lightning conductors, both considered that the position in which the man was working did increase the danger above that of working on the ground or in shelter. His Honour gave judgment for the plaintiff with costs, but granted a stay of execution and consented to state a case for appeal. He thought the question was one in which it was desirable that there should be a decision of the higher court. Pending the decision of the appeal he directed that the respondents should pay the widow 1*l*. a week on account (*Lancet*, 2, 1903, p. 1468).

Andrew v. *Failsworth Ins. S.* (Appeal Court, 1904) upheld this decision, as the work was of an exposed nature. In 1901 an *obiter dictum* in a Scotch case (38 Sc. L. R. 381) affirmed the contrary.

Disease Arising out of an Accident.

In *Cross* v. *Railw. Accid. Insur. Co.* (Lewes Sum. Ass., 1871) this question was raised under the following circumstances :—

A lady of sixty-six effected an insurance on her life against accidents of any kind; and the company undertook to pay 500*l.* in the event of her death within three months after *an accident*. On April 20th, 1870, she fell downstairs, and it was stated that she had then received an injury of which she died on December 11th following. The company, however, disputed their liability for more than 30*l.*, which they paid into court. They denied that the accident was the cause of death, and suggested that she was already suffering under disease, and that she was not disabled from the effects of the accident for more than ten weeks. The plaintiff, however, who was the lady's residuary legatee, stated that she was quite healthy when the accident occurred, and she and two other witnesses proved that she was walking about the town up to the day of the accident. From the nature of the case, it turned chiefly on the medical evidence—in which there was some contradiction. The medical men who first attended her found no indication of such an accident as would have caused her symptoms, which they ascribed to Bright's disease and dropsy: Tatham formed the same opinion, and they were called for the defence; while Wheatley, who had attended her, was called for the plaintiff, and was of opinion that the symptoms arose from the accident.

Bramwell, B., told the jury he felt inclined to leave it to them without remarks on his part, for really how could he attempt to discriminate between these conflicting opinions of the medical men? He ventured, however, to suggest that Tatham in some important points confirmed the evidence of Wheatley, and he could not help suggesting this practical test—Was the woman in a good state of health to all appearance just before the accident, and did the symptoms come on immediately afterwards? If so, then it was difficult to avoid the inference that the accident had something to do with it. Two witnesses beside the plaintiff (who was interested) alleged that the woman was walking about up to the very day of the accident. The jury, however, must be satisfied that the accident had disabled the deceased for more than ten weeks in order to entitle the plaintiff to a verdict beyond the sum paid into court. The jury, after some consideration, gave a verdict for the defendants, believing that the sum paid into court was sufficient to cover all the damage arising from the accident.

In December, 1900, the editor took part as an arbitrator on the plaintiff's side, Professor Pepper representing the defendants, and Dr. Mitchell Bruce acting as umpire, in the case of *Shaw* v. *The Railway Passengers' Assurance Company*. The facts of the case were comparatively simple originally. The plaintiff Shaw was thrown from his trap and severely injured internally. He temporarily improved, but died some ten weeks after the accident. At the necropsy a soft mass of tissue was found in the pelvis, which the medical men said was blood-clot, but by the Clinical Research Association was declared to be a form of sarcoma, and the company thereupon disputed payment. The arbitrators and umpire were unanimously of opinion that the examination of one microscopical slide was insufficient to establish the fact of sarcoma being present, and thereupon ordered the payment to be made.

Now it must be within the knowledge of every medical man of large experience (the editor can certainly give one such clear example) that sarcomata do develop *after*, and so far as medical science can go, *because* of a blow; and the case above quoted was of special interest in that the policy contained a clause which would have exempted the company from payment if it could have been proved that the patient had really died of sarcoma. It behoves every one who is insured thus against death by accident to appreciate the meaning of the clause, which in such cases as the above seems to give the company a very

great advantage, for it expressly excludes deaths occurring from the influence of accident on a pre-existing disease or from *disease* arising out of an accident.

The clause itself, copied from the editor's own policy with the Accident Insurance Company, runs as follows :—

> Provided further that this policy with reference to compensation for injury to the insured applies only to accidents injuries death or disablement directly and solely caused by some outward and visible means [Definition of Accident—Ed.] of which proof satisfactory to the directors shall be furnished and does not apply to accidents injuries death or disablement caused by or arising wholly or in part from fits disease or other intervening cause or weakness or exhaustion even although the disease or other intervening cause may either directly or otherwise have been aggravated by accident or the death accelerated thereby and does not apply to accidents injuries death or disablement caused by or arising from any medical or surgical treatment, or treatment intended so to be whether by the insured or any other person or to accidents injuries death or disablement caused by duelling or fighting or other breach of the law on the part of the insured or by war invasion or civil tumult or by travelling on a railway otherwise than in a carriage provided for the conveyance of passengers or by entering or leaving a carriage when the train is in motion or otherwise acting in violation of any railway company's byelaws rules and regulations or by intentional self injury or by suicide or attempted suicide whether felonious or otherwise [Steeplechases, Trespassing—Ed.] or is under the influence of intoxicating liquors or is in a state of insanity whether temporary or otherwise or when otherwise rendered incapable of taking care of himself or wilfully or negligently exposing himself to danger or peril except in the endeavour to save human life.

The editor cannot find any definite legal decisions on the point, and it is one which is open to a great deal of argument. Take a case such as the following easily conceivable one : A man falls and injures his urethra, stricture results, and in six months leads to operation, from which the patient dies. It would seem obvious that a claim under an accident policy should here succeed, and yet it is very doubtful if it would (see *Mardorf* v. *Acc. Ins. Co.*, C. A., 1903, 1 K. B. 504).

Take the following case, reported to the editor by Dr. Satchell, of Moseley, Birmingham :—

> A workman, at the end of June, 1902, fell down some steps at the works at 9 a.m. He was unconscious for a while, but got a little better, and tried to work, but went home at 4 p.m. in great pain. Dr. Satchell found he had broken two or three ribs (fracture-simple, no surgical emphysema). On the fourth day pneumonia developed, in bed a fortnight; three weeks after the accident went away convalescent; five weeks after the accident he walked four miles and was practically well, but the next day he died suddenly. The coroner's jury returned a verdict of death from natural causes. There was no post-mortem. His Honour Judge Whitehouse gave a verdict for the widow for 200*l*. (three years' wages).

Or a somewhat similar case that came before the editor in 1903 :—

> A man was in a railway accident, and as a consequence developed heart disease. He died of pneumothorax some three months after the accident. The Accident Insurance Company gave his widow a small solatium.

Both these cases are incomplete, owing in each instance to the almost culpable carelessness of the coroners in not ordering autopsies. In neither case is it at all clear that death was due to the accident, and yet in each case there was some presumption that it was so. The matter could only have been cleared up by a careful post-mortem examination.

There can be no hesitation in advancing as a self-evident proposition

that every person who is insured in an Accident Insurance Company should have by him an order that his body is to be examined after death, and the insurance companies ought to have a clause to this effect in their policies.

For a further discussion on "What is an Accident?" *vide* *B. M. J.*, 2, 1903, p. 1661.

DISABLEMENT.

As already stated, in ordinary civil actions it is the amount and permanency of disablement which causes the sharpest conflict of medical opinion. The Workmen's Compensation Act, 1897, on this point expresses itself as follows:—

Par. 1.—(2) The employer shall not be liable under this Act in respect of any injury which does not disable the workman for a period of at least two weeks from earning full wages at the work at which he was employed.

Schedule I.—Scale of compensation. The amount of compensation under this Act shall be—

(1).—(*a*) Where death results

(*b*) Where total or partial incapacity for work results from the injury a weekly payment during the incapacity after the second week not exceeding fifty per cent. of his average weekly earnings . . . such weekly payment not to exceed one pound.

(2) In giving the amount of the weekly payment, regard shall be had to the difference between the amount of the average weekly earnings before the accident and the average amount he is able to earn after the accident. . . .

(3) Where a workman has given notice of an accident he shall, if required by the employer, submit himself for examination by a duly qualified medical practitioner *provided and paid by the employer*, and if he refuses to submit himself to such examination, or in any way obstructs the same, his right to compensation . . . shall be suspended till such examination takes place.

(11) Any workman receiving weekly payments under this Act shall, if so required by the employer, or by any person by whom the employer is entitled under this Act to be indemnified, from time to time submit himself for examination by a duly qualified medical practitioner provided and paid by the employer, or such other person; but if the workman objects to an examination by the medical practitioner, or is dissatisfied by the certificate of such practitioner upon his condition when communicated to him, he may submit himself for examination to one of the medical practitioners appointed for the purposes of this Act, as mentioned in the Second Schedule to this Act, and the certificate of that medical practitioner as to the condition of the workman at the time of the examination shall be given to the employer and workman, and shall be conclusive evidence of that condition. If the workman refuses to submit himself to such examination, or in any way obstructs the same, his right to such weekly payments shall be suspended until such examination has taken place.

In January, 1904, under this clause, the following important appeals were decided:—

Court of Appeal (before the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy).

Important Compensation Act Appeals.

Neagle v. *Nixon's Navigation Company, Limited*, and *Edwards* v. *Guest, Keen, and Nettlefolds*, and *Hiatt* v. *Same*.—These three cases, which were specially put in the list together, raised a new and important question under the Workmen's Compensation Act, 1897. In the first case the workman appealed from a decision of the judge of the Merthyr Tydvil County Court, who decided in favour of the

employers. In the second and third cases the employers appealed from a decision of the county court judge at Pontypridd, who upheld the workmen's contention. The short point was whether a workman, in receipt of weekly payments under the Act, who had already submitted himself for examination to a doctor acting on behalf of the employer, but refused to submit himself for examination by the official medical referee, did away with his right to the weekly payments until such examination by the medical referee had taken place. The question turned upon the construction of Clause 11 of the first Schedule in the Act, which provides that a workman in receipt of weekly payments *shall*, if so required by his employer, from time to time submit himself for examination by a duly qualified medical practitioner provided and paid for by the employer, with a right to the workman, if he so desires, to be instead examined by one of the medical practitioners appointed under the Act, whose certificate shall be *conclusive evidence* of the man's condition, and, "if the workman refuses to submit himself to such examination, or in any way obstructs the same, his right to such weekly payments shall be suspended until such examination has taken place." The facts were substantially the same in all three cases: the employers, having reason to believe that the man had recovered, requested him to submit himself for medical examination by their doctor. This he did, and the report was that the workman in each case had practically recovered. The weekly payments were accordingly stopped. The workman then applied to the county court judge, and the employers moved to suspend all payments until the workman had submitted himself for the examination of the medical referee. In the case of Neagle, the judge held that the man must submit himself for examination by a medical referee, and suspended payments. In the other two cases the judge held the opposite view. Hence the three appeals.

Mr. S. T. Evans, K.C., Mr. Rhys Williams, and Mr. J. Sankey appeared for Neagle; Mr. Haldane, K.C., Mr. Ruegg, K.C., and Mr. Parsons for the employers in all three cases; while Mr. Asquith, K.C., argued the case for the workmen in the second and third appeals.

The Master of the Rolls, in giving judgment, said the point lay in a very small compass, having regard to the terms of Clause 11 of the first Schedule. It seemed to him clear that it was a condition precedent to the right of the workman to ask for compensation to be assessed (the employer having stopped the weekly payments) that he should submit himself, not only to the examination which he had already undergone at the hands of the employer's doctor, but also to the examination of the official medical referee appointed under the Act. It had been argued for the employers that the words, "such examination," used in the last sentence of Clause 11, referred to the examination by the official referee, and, therefore, if a workman who had already submitted to examination by his employer's doctor declined to undergo examination by the official referee, the employers were justified in stopping payments. He was unable to agree with that view. He thought a workman's right to the weekly payments ceased only on his refusing to submit to examination by the employer's doctor, which was, in his opinion, the only examination a master had a right to insist upon under the statute. The examination by the official referee was at the

option of the workman, who, if he exercised that option, did so at his own risk, for the report of the official referee was final. Therefore, the appeal in Neagle's case must be allowed, and the other two appeals dismissed with costs. The Lords Justices concurred, and judgment was given accordingly.

Schedule II.—Arbitration—says:—

(13) The Secretary of State may appoint legally qualified medical practitioners for the purpose of this Act, and any committee, arbitrator, or judge may, subject to regulations made by the Secretary of State and the Treasury, appoint any such practitioner to report on any matter which seems material to any question arising in the arbitration; and the expense of any such medical practitioner shall, subject to Treasury regulations, be paid out of moneys to be provided by Parliament.

In the Statutory Rules and Orders, 1898, No. 345, Regulation (13), by the Secretary of State, says:—

19. In any case of special difficulty the judge, or appointed arbitrator, may require the attendance of the medical referee at any proceedings in the arbitration subsequent to the receipt of the report, at a date and hour to be arranged, and the medical referee shall attend accordingly, but this regulation shall not authorise the medical referee being called as a witness.

Finally, the medical certificate of a referee runs as follows, under Schedule I. (ii.):—

I, , a registered medical practitioner appointed by the Secretary of State for the purposes of the Workmen's Compensation Act, 1897, have this day examined , residing at , who stated that he was suffering from the effects of injuries, viz.:— received on the day of at , while in the employment of , as a , and I hereby certify that his condition is as stated below:— . He is (*a*) and his condition is such that he is (*b*)

In my opinion the cause or causes of the workman's present disablement are (*c*)

(Signed) Name .
Address .

(*a*) Here insert "recovered" *or* "suffering from ."

(*b*) "Fit for his ordinary work," "fit for light work" (defining where possible the kind of work), *or* "unfit for work of any kind."

(*c*) "Injury as stated above," *or* "old age," *or* "organic disease not caused by such injury," etc., etc.

Such are the principal clauses affecting medical men and their evidence under this Act.

For further particulars on Medical Referees under the Act and the causes for their non-employment, *vide B. M. J.*, 2, 1903, p. 1353, also Willis's Workmen's Compensation Acts.

The following, taken from the *B. M. J.*, 2, 1903, p. 341, is an interesting example of the uses to which a medical referee's certificate may be put, and is also one more illustration, if that were needed, of the necessity for thorough post-mortem examination by competent observers in *all* accidental deaths:—

At the Aberdare County Court there was heard on July 29th a case which raised an interesting question as to the effect of a certificate given by a medical referee under the Workmen's Compensation Act. It is made plain in the Act itself that the primary object of such a certificate is to settle the question whether the employers must continue to make weekly payments to a disabled workman. It seems, however, that the certificate may also prove to be of value to the employer in cases where death results from an accident. According to the report published in the *South Wales Daily News*, a workman employed by the Powell Duffryn Colliery Company met with an accident in the course of his employment on June 3rd, 1902, by being squeezed against a water tank. A few days afterwards a medical referee appointed under the Workmen's Compensation Act certified that the man had recovered from the injury; but

he was unable to do any work and ultimately died. A necropsy showed that he had been suffering from a form of phthisis. A claim having been made for compensation under the Act, it appeared at the trial that the referee had given two certificates, in the first of which (dated October 13th) he had stated that the man was recovering, but was unfit for work, from an illness which was not caused, but which was aggravated by, the injury. In his last certificate, however, he said that the organic disease was not caused by the injury. It was argued on the part of the workman that the medical referee's certificate was applicable only to cases in which the workman was in receipt of weekly payments. Reference was made to Sect. 11 of the first Schedule to the Act, which provides that any workman receiving weekly payments under the Act shall submit himself to a medical practitioner appointed in a certain way, "and the certificate of that medical practitioner as to the condition of the workman at the time of the examination shall be given to the employer and workman, and shall be conclusive evidence of that condition." On behalf of the workman it was admitted that the certificate was final so long as there was no change in his condition; but here the death of the patient had made a fundamental alteration. It was argued on behalf of the employers that the certificate was final and conclusive, and another doctor was called who could say from his own knowledge that death had not resulted from the injury.

The learned judge ruled that the certificate was only strong evidence in the employers' favour; but he eventually found as a fact that the death was not caused by the accident, and gave judgment for the employers.

Except for special legal points which have no concern for medical men, the actions brought under this Act are precisely like those brought under other Acts for compensation. On the one side the medical man engaged by the plaintiff naturally enough believes the tale told him by his patient, and expresses his belief that the injury (broken, sprained, cut, or crushed limb or back) has caused a prolonged, if not permanent, diminution in his earning capacity; on the other side, the medical man appearing for the company accepts with limitations the statements of the plaintiff, and gives evidence that the earning capacity is not so much diminished as might appear, and that in some cases deliberate malingering is resorted to in support of a claim.

One general principle has much struck the editor in the cases referred to him (whether as "official referee under the Act" or in his private capacity), viz., that injured workmen often fear, that pain on working with the injured part, necessarily implies that work will cause further increased injury and trouble, and it is in removing this fear that he has met with most gratifying success. In fractured bones the pain may depend for its duration very materially on the obliquity of the fracture, thus in the leg bones the more oblique the line of fracture, the longer the pain (when weight is thrown on the limb) will last, owing to the fact that the greater the obliquity the greater the proportion of such pressure that has to be borne by the callus and new bone; the more transverse, the greater the proportion of pressure that is borne by the old bone and transmitted perpendicularly to the line of fracture, a direction which causes little or no pain.

For an instructive article on the examination of cases in which "defective vision as the result of accident" is alleged, *vide B. M. J.*, 1, 1904, p. 483, paper by J. J. Evans.

For an important decision (by Mr. Justice Bray) on an Accidental Insurance Policy *vide Times* newspaper for Dec. 22, 1904: inserted at end of Vol. II. of this work.

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